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ABSTRACT

The Beginning Teacher Evaluation Study (BTES), Phase II, was a research project on effective teaching behavior--what teachers do that significantly affects what and how pupils learn. The purposes of Phase II were to (1) develop an assessment system for measuring teacher and pupil behaviors and other factors which could influence each of them and their interrelationships and (2) generate hypotheses about the interrelationships among teacher and pupil behaviors and related factors. Forty-one second grade and 54 fifth grade experienced teachers participated in the study. This volume of the final report presents information on the structured work diaries which include five separate instruments developed to yield comprehensive information about the approaches of individual teachers to reading and mathematics instruction. The instruments were: Reading Program Overview, Mathematics Program Overview, Reading Work Diary, Mathematics Work Diary, and Reading and Mathematics Work Diary for Paraprofessionals and Other Teaching Adults in the Classroom. The information from the Work Diaries and the Program Overviews was organized to indicate, by grade level and within subject areas, the academic emphasis, the quality of the teaching methodology, the complexity of organizational structure, and the variety and types of instructional materials used. The accuracy of sections of the teacher reports was tested against observational information from the project classrooms and related to pupil skill growth in reading and mathematics. (RC)

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BEGINNING TEACHER EVALUATION STUDY
PHASE II 1973-74

FINAL REPORT

VOLUME V.5.

THE REPORTS OF TEACHERS ABOUT THEIR MATHEMATICS AND READING INSTRUCTIONAL ACTIVITIES

BY

PATRICIA ELIAS
GAIL HARE
PATRICIA WHEELER

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EDUCATIONAL TESTING SERVICE
PRINCETON, NEW JERSEY

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FINAL REPORT: VOLUME V.5.

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Berkeley, California

A project conducted by Educational Testing Service for the California Commission for Teacher Preparation and Licensing and funded by the National Institute of Education.

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PREFACE

The Beginning Teacher Evaluation Study (BTES) is a long-term project of the California Commission for Teacher Preparation and Licensing. The Commission is responsible for licensing teachers in California and is trying to determine what factors should be considered in this process.

The second phase of the study was conducted by Educational Testing Service for the Commission. Phase II was the hypotheses-generating and instrument-development phase of BTES. ETS had two tasks: (1) to develop an assessment system to measure both teacher and pupil behaviors as well as other factors which might be related to these behaviors; and (2) to generate hypotheses about the interrelationships between teacher and pupil behaviors and related factors.

The study was conducted in 43 schools in eight districts throughout the state of California. A total of 41 second grade teachers and 54 fifth grade teachers participated in the project during Phase II.

The final report for Phase II consists of several volumes. Volume I describes the design and rationale for the experimental design and data analysis procedures and includes the major findings of Phase II. Volume II describes the conduct of the field study and the sample of participants.

Because of the complex nature of Phase II, a variety of techniques was used to measure teacher and pupil behaviors. They are described in Volumes III, IV, and V. Results are also included in these volumes.

Volume III describes the observation systems in detail and is available in three separately bound sections. The first section, Volume III.1., describes the behavior recording observation system used in the project--APPLE (Anectdotal Process for Promoting the Learning Experience). Volume III.2. describes the category system used to observe classroom activities--

RAMOS (Reading and Mathematics Observation System). The third section of this volume, III.3., covers the videotaping of instructional activities during reading and mathematics.

Volume IV concerns other aspects of the measurement system and covers both the pupil and teacher test batteries.

The fifth volume covers a series of small studies done as part of Phase II. Volume V.1. looks at teacher aptitudes as related to teacher behaviors. Volume V.2. is concerned with the relationship between teacher expectations and pupil performance. Volume V.3. reviews performance of pupils in the BTES teachers' classrooms for two years prior to Phase II, the historical test data. Volume V.4. discusses the Diagnostic Film Test, a device designed to assess teachers' skills in diagnosing reading problems and prescribing corrective action. Volume V.5. summarizes the results of work diaries completed by the teachers on their reading and mathematics instructional program.

Information on the availability of these volumes can be obtained from:

Dr. Frederick J. McDonald
Educational Studies
Educational Testing Service
Princeton, NJ 08540

Information on other phases of BTES can be obtained from:

California Commission for Teacher
Preparation and Licensing
1020 O Street
Sacramento, CA 95814

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Patricia Elias
Gail Hare
Patricia Wheeler

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The Diaries and Overviews

The overall purpose of Phase II of the Beginning Teacher Evaluation Study was to examine the "relationships between the classroom behavior of elementary school teachers and the outcomes achieved by students in their classrooms."[1] Phase II of the study was devoted to the generation of hypotheses and instruments which could be useful in that effort. The structured Work Diaries were intended to provide a vehicle for teachers to describe their programs in reading and mathematics directly. Five separate instruments were developed to yield comprehensive information about the approaches of individual teachers to reading and mathematics instruction. The instruments were:

Reading Program Overview
Mathematics Program Overview
Reading Work Diary
Mathematics Work Diary
Reading and Mathematics Work Diary for Paraprofessionals and Other Teaching Adults in the Classroom

Sections of the Work Diaries and Program Overviews were formulated to reflect the structure of each teacher's program in reading and mathematics, to identify materials and strategies used, and to determine the availability and use of other teaching adults in the classroom. The Program Overviews were intended to provide a summary of each teacher's program in reading and mathematics for the entire school year. The Work Diaries were designed to reflect the instructional process during one school week. The Diary for Paraprofessionals and Other Teaching Adults in the Classroom also covered a one week time

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[1] p. 1, Phase II Proposal

period and was concerned with the functions of adult assistants in the classroom.

Development of the Work Diaries and Program Overviews

A two stage process was employed in the development of the Work Diaries and Program Overviews. During the fall phase of the study the first draft of the Reading Work Diary was presented to thirty-six teachers from selected project schools from four school districts in Northern and Southern California. Of this group, sixteen were second grade teachers and twenty were fifth grade teachers. Teachers reviewed the Reading Diary, teacher comments were recorded and then synthesized for implementation in the later version of the instrument.

The teacher review was an integral part of developing the Diaries. Since the instruments were intended for teachers to use with little or no direct project staff support, it was essential that both the structure and content be understandable and sensible to the teachers. In general, the reviewing teachers found the Work Diary's original structure to be a quick and efficient way to provide information on their programs. Surprisingly, the reviewing teachers seemed to be less interested in simplifying and minimizing the task than they were in having the opportunity to give detailed and descriptive information which could reflect the individual quality of their teaching programs. The reviewing teachers also suggested that the information might be more meaningful if it were collected more than once during the year. The original form of the Reading Work Diary was revised and expanded, and the additional instruments were developed.

After the entire battery of instruments had been prepared, eight teachers of the original thirty-six reviewers were asked to provide a

final critique of the two Diaries, the two Program Overviews, and the Diary for Paraprofessionals. The panel was composed of four second and four fifth grade teachers from two school districts. Two suggestions for revisions were made (one for an addition and one for a clarification) and both were incorporated into the final form of the instruments.

The Reading Program Overview. The Reading Program Overview contained two major sections. The first of these sections elicited information about the skills taught and materials used by the teacher during the school year. The second section asked for information about the availability and uses of personnel in the classroom in addition to the teacher.

A skills matrix was used as part of the Overviews and Diaries to gather information about the skills taught by the teacher during the year. Part of the reading skill matrix is reproduced in Figure 1.

List of Skills	Which skills need not be taught because pupils already know these skills?	Which skills have you introduced this year?	Which skills have you reviewed this year?	Which skills will you be teaching in the remaining months of the school year?	Which skills are not taught at your grade level because these skills are taught at a higher level?
I. Decoding					
(a) Phonetic					
Symbol - sound relationship					
Consonant sounds					
Consonant blends					
Short vowels					

Figure 1. A section of the skills matrix from the Reading Program Overview.

In addition to checking the skills which they introduced, reviewed, or planned to teach during the remainder of the school year, teachers were asked to indicate skills which did not have to be taught, either because their pupils had already mastered them or because the skills were taught at a higher level. The four major categories of reading skills covered were: Phonetic and Structural Decoding, Vocabulary, Comprehension, and Application.

To determine what materials teachers used in the teaching of reading, eleven different types were listed, with an additional open ended category for any materials not covered within the list. Teachers were asked to indicate the approximate percentage of use of each type of material in their total reading program, and to specify or describe the materials used. Teachers were given the option to comment on the materials that they used, and to describe any materials they had developed themselves.

The second section of the Overview, "Utilization of Human Resources in Addition to the Classroom Teacher," was intended to explore the availability and use of personnel other than the teacher for reading activities. Information was sought about the number and kinds of resource people available to the teacher, the amount of time spent by such personnel in teaching, and the kinds of reading skills taught by them. Other questions detailed the management of resource people in the classroom.

The Mathematics Program Overview. The Mathematics Program Overview was very similar in format to the Reading Program Overview, and was intended to obtain similar kinds of information. The instrument first

delved into the skills taught by the teacher and the materials used in the classroom. The categories of skills dealt with in the mathematics matrix included: Problem Type, Operations, and Specialized Skills. A list of ten types of materials was included. The second section of the Overview, "Utilization of Human Resources in Addition to the Classroom Teacher," was directed to the uses of resource people in mathematics activities.

The Reading Work Diary. The Reading Work Diary has five major sections intended to obtain information about teaching activities during any given one-week period. In the first section teachers were asked to record the approximate number of minutes spent each day during the week in preparation for the teaching of reading. The second section covered the frequency of and time spent in the direct teaching of reading skills during the week. A matrix listing the same skills as did the matrix in the Reading Program Overview was presented. Teachers were asked to indicate which skills had been introduced, reviewed, or emphasized during the week that the Diary was completed. Because the Reading Work Diary focused on activities during a specific time period, teachers were not asked what skills had already been learned or would be learned in the future by their pupils. In addition to obtaining information about which specific skills were taught, information was also obtained about the total amount of time spent per day in the direct teaching of reading and the amount of time spent per day in teaching each of the four major reading skills.

The focus of the third section was a description of the classroom environment. Teachers were asked to describe strategies, pupil

activities, and the materials used to teach the reading skills which were introduced, reviewed or emphasized during the week.

The fourth section was directed to the organization of pupils for reading instruction. Teachers were asked to indicate the organizational patterns most descriptive of their reading program: simultaneous instruction of all pupils, grouping based on reading level, grouping based on needs for particular skills, or individualized instruction. If none of these options adequately described an individual teacher's program, there was the opportunity to describe what other pattern of organization was employed. For the organizational strategies except simultaneous instruction, teachers were asked to provide more detailed descriptions of grouping. The skills matrix was also reproduced in this section, and the teachers were asked to indicate how many children had been taught each skill.

The last section in the Diary was the "Utilization of Human Resources in Addition to the Classroom Teacher." Teachers were asked to indicate the kinds of resource persons available to them during the week of Diary completion. A list was made of the children each resource person taught during the week. Information was also gathered on where such reading instruction took place; the training or experience of the resource persons; the amount of time spent by each teaching reading to children in the class; and, the types of activities that resource persons engaged in during reading instruction. In addition, the teachers were asked to indicate how the resource personnel decided what they were to do.

The Mathematics Work Diary. The Mathematics Work Diary was similar to the Reading Work Diary in format and content with obvious

redirection to mathematics instruction. The skills matrix in the Mathematics Work Diary covered the Problem Type, Operations, and Specialized Skills categories included in the Mathematics Program Overview.

Reading and Mathematics Work Diary for Paraprofessionals and Other Teaching Adults in the Classroom. This instrument was designed to describe some of the reading and mathematics instructional activities of paraprofessionals and other teaching adults in the project classrooms. Teachers were asked to have each adult (including high school students) who worked in the classroom during the week of information collection complete a Diary. Each volunteer or paid adult was asked to indicate the number of hours worked and if that was a typical work week.

The second section of the Diary was directed to reading activities. Adults were asked to list the children they had worked with during the week, and to indicate how the children they worked with were grouped. They were asked to record the number of minutes spent each day in preparing for teaching reading as well as in the direct teaching of reading. They were asked whether the amount of time spent in the direct teaching of reading was typical, and what percentage of their time in the classroom was devoted to the teaching of reading.

Another component in the reading section was a checklist of activities that a teaching adult other than the teacher might engage in. Classroom assistants were asked to indicate those which applied to their work during the information gathering week. To find out about the management of personnel in the classroom, the classroom assistants were asked how activities were decided upon. The same

question was asked of teachers in the "Utilization of Human Resources" section of the Work Diaries.

The third section covered activities connected with mathematics instruction, with questions similar to those asked about reading. The classroom assistants were asked to estimate the percentage of their time spent in reading activities, in mathematics activities and in "other" activities.

The last section of the Diary asked for biographical information. Included were questions about educational level attained, bilingualism and years of experience in the school. The amount of inservice training in reading and mathematics was requested as well as a rating of the effectiveness of that training. Respondents were also asked to describe what they thought to be their greatest strengths in working in the classroom in both subject areas.

Data Collection

Teachers were asked to complete the Reading and Mathematics Diaries twice during the spring of the data gathering year. The two target weeks were eight calendar weeks apart. The Program Overviews were completed only once. All of the 95 teachers returned the first set of materials, and 93 returned the second set. Eighty-seven Diaries from other teaching adults were returned with the first set of materials, but fewer were completed the second time. Several teachers asked that their assistants not be burdened with the task twice.

The very high teacher return rate was not accidental. Anyone interested in attempting to collect this kind of information should

review the section about the Diaries in Volume II of the final report, where staff efforts to support the data gathering process are described.

Problems encountered. The staff received feedback on the teacher report battery in many forms. Teachers reported that completing the Diaries and Overviews carefully was very time consuming. Some teachers found the terminology of the mathematics instruments difficult. Most teachers did not complete the complicated skills matrices on classroom organization contained in the Reading and Mathematics Work Diaries.

In general, we found that the forms worked well as a vehicle for teachers to use to report their own activities. This was due, in no small part, to the extraordinary level of teacher interest and effort. The problems encountered were not insuperable as evidenced by the fact that all but one of the teachers provided the information. That one teacher asked in advance to be relieved of this task because of other commitments.

Results

The results were organized into logical categories of information drawn from all five of the self-report performance measures. The five data sources and the frequency of their collection are repeated here for reference:

1. The Reading Program Overview (RPO), completed once by the teachers;

2. The Reading Work Diary (RWD), completed for two teaching weeks by teachers;

3. The Mathematics Program Overview (MPO), completed once by teachers;

4. The Mathematics Work Diary (MWD), completed for two teaching weeks by teachers; and,

5. The Reading and Mathematics Work Diary for Paraprofessionals and Other Teaching Adults in the Classroom (RMWD), completed for two school weeks by adults other than the teacher.

The information gathered from the battery was organized to indicate, by grade level and within subject areas, the academic emphasis, the quality of the teaching methodology, the complexity of organizational structure, and the variety and types of instructional materials used. Mathematics and reading information were handled in an identical manner. To illustrate this organization of the work sample information, the inclusions in the categories for reading are outlined below.

<u>Academic Emphases in Reading</u>

I. Use of Time

A. Teacher (source RWD)

1. preparation time
2. actual total teaching time
3. actual time teaching specific skills
   a. decoding skills
   b. vocabulary skills
   c. comprehension skills
   d. application skills

B. Other Teaching Adults in the Classroom (source RMWD)

1. preparation time
2. actual teaching time
3. proportion of time spent in reading, mathematics and "other" activities (to add to 100 percent of classroom time)

II. Frequency of Reading Skills Taught

A. Teacher (source RWD)

1. frequency of specific skills taught
   a. decoding skills
   b. vocabulary skills
   c. comprehension skills
   d. application skills

B. Other Teaching Adults in the Classroom (source RMWD)

1. frequency of skills taught
   a. decoding skills
   b. vocabulary skills
   c. comprehension skills
   d. application skills

III. Skills Teachers Do Not Plan to Teach

A. Teacher (source RPO)

1. frequency of skills not taught
   a. decoding skills
   b. vocabulary skills
   c. comprehension skills
   d. application skills

<u>Quality of the Teaching Methodology (source RWD)</u>

1. for skills introduced
2. for skills reviewed

<u>Complexity of the Organizational Structure in the Classroom</u>

I. Organizational Patterns of Pupils for Instruction

A. Teacher (source RWD)

1. pupils are taught all reading skills simultaneously
2. pupils are organized in reading groups based on their reading level
3. pupils are organized in reading groups based on their needs for particular skills
4. pupils are organized in individual reading instruction
5. other

B. Other Teaching Adults in the Classroom (source RMWD)

1. individualized instruction
2. small group instruction
3. large group instruction
4. any of the above depending on the task

II. Utilization of Human Resources in Classroom

A. Percentage of pupils taught reading by the teacher only (source RPO and RWD)

B. Ratio of adults to children during reading instruction (source RMWD)

Variety and Types of Materials Used in Total Reading Program (source RPO)

I. Approximate Percentage Usage in Program

A. Basal reader - state adoption
B. Basal reader - other
C. Individualized materials
D. Programmed materials
E. Taped programs
F. Reading kits
G. Teacher-made materials
H. Games
I. Newspapers
J. Reading workbooks that accompany a basal text
K. Other reading or phonics workbooks
L. Additional materials

Academic Emphases

Academic emphases included three general information categories: how much time teachers reported spending in preparing for and teaching reading and mathematics skills; how frequently teachers reported teaching specific reading and mathematics skills; and, the specific skills in reading and mathematics that teachers reported they did not plan to teach. Each of these categories will be discussed both in this section and in later sections which describe their relationships to the pupil achievement measures used in the project.

The use of time. Second grade teachers reported spending more time preparing for and teaching reading in total than did fifth grade teachers. The opposite was true for mathematics (Tables 1, 2, 3, and 4). Fifth grade teachers spent more time preparing for and teaching mathematics than did second grade teachers. Both second and fifth grade teachers spent more actual time preparing for and teaching reading than they did mathematics.

The figures in the first four tables were aggregated by averaging the reports teachers gave on the time one and time two Work Diary collections about their preparation and direct teaching time. Thus, these figures represent the average time per teacher for one week. The standard deviations suggest a great variation in preparation and teaching time. The standard error reported is the standard error of the mean, or how much the mean might be expected to vary with respect to other populations or samples.[2]

There was more variation in the teaching time patterns for specific skills taught in second and fifth grade reading than there was in second and fifth grade mathematics. Second grade teachers, as would be expected, spent more absolute and proportional time teaching decoding and vocabulary skills than did fifth grade teachers. Both groups reported spending more time teaching the more generic reading comprehension and application skills than they did teaching the more specific decoding and vocabulary skills. While there was variation in the amount of time spent teaching problem type skills in mathematics

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[2]Nie, Bent, and Hall, 1970, pp. 96-102.

Table 1

Teacher Reported Allocation of Preparation and Teaching Time in Minutes for Reading: Grade Two

	Mean	Standard Error	Standard Deviation
Preparation Time	161.5	15.3	97.0
Direct Teaching Time: Total	300.0	23.6	149.2
Direct Teaching Time Specific Skills:			
Decoding	88.0	9.2	62.0
Vocabulary	82.0	9.7	60.6
Comprehension	104.9	12.1	75.3
Application	109.8	12.8	79.7

Table 2

Teacher Reported Allocation of Peparation and Teaching Time in Minutes for Reading: Grade Five

	Mean	Standard Error	Standard Deviation
Preparation Time	137.0	11.1	80.0
Direct Teaching Time: Total	276.2	18.2	129.8
Direct Teaching Time Specific Skills:			
Decoding	44.1	5.5	37.5
Vocabulary	55.0	4.7	32.3
Comprehension	86.2	6.7	45.7
Application	89.2	9.0	61.8

Table 3

Teacher Reported Allocation of Preparation and Teaching Time in Minutes for Mathematics: Grade Two

	Mean	Standard Error	Standard Deviation
Preparation Time	124.4	13.8	87.3
Direct Teaching Time: Total	179.0	11.3	72.6
Direct Teaching of Specific Skills:			
Problem Type	41.9	5.3	33.2
Operations	86.3	8.8	55.3
Special Skills	50.0	6.3	39.8

Table 4

Teacher Reported Allocation of Preparation and Teaching Time in Minutes for Mathematics: Grade Five

	Mean	Standard Error	Standard Deviation
Preparation Time	130.1	11.8	83.9
Direct Teaching Time: Total	207.4	12.6	91.9
Direct Teaching of Specific Skills:			
Problem Type	55.2	6.6	46.9
Operations	89.3	9.1	63.4
Special Skills	44.4	5.9	41.5

between the two grade levels, the teaching time for operations and special skills appeared fairly similar across the two grades.

These results may be confounded somewhat by the fact that the amount of time teachers reported spending teaching specific skills did not necessarily equal the time teachers reported spending in the total direct teaching of a subject. Another confounding variable might be the limitations of the skills lists the teachers were provided within each subject area. However, it does appear that there was greater grade level variation in emphases and priorities in the teaching of reading than there was in the teaching of mathematics.

As the outline of inclusions in the Work Diaries indicated, detailed information was collected on the activities of teaching adults in the classroom other than the teacher. For the purposes of this report, that information has not been particularized. The emphasis here will be on teacher-reported activities. Some generalizations about other teaching adults will be provided in later sections of this report.

The reported frequency of reading skills taught. Teachers were asked to check skills that they had "introduced" or "reviewed" during each of the two weeks the Diaries were maintained. The information in Tables 5 and 6 represents the total numbers of skills taught for the two weeks of data collection. The two weeks were aggregated to maximally represent the differences among teachers.

Table 5

Teacher Reported Frequencies of Specific Reading Skills Introduced and Reviewed: Grades Two and Five

Frequency	GRADE 2 Mean	GRADE 2 Standard Deviation	GRADE 2 Range	GRADE 2 Median	GRADE 5 Mean	GRADE 5 Standard Deviation	GRADE 5 Range	GRADE 5 Median
Decoding	10.3	3.0	0-13	11	7.8	4.2	0-13	7
Vocabulary	2.3	.9	0- 3	∿ 2	1.4	1.1	0- 3	∿ 1
Comprehension	6.9	2.6	0-10	∿ 7	5.5	3.0	0-10	∿ 5
Application	9.2	3.5	0-14	∿ 9	7.9	4.3	0-14	∿ 8
	N=40				N=54			

Table 6

Teacher Reported Frequencies of Specific Mathematics Skills Introduced and Reviewed: Grades Two and Five

Frequency	GRADE 2 Mean	GRADE 2 Standard Deviation	GRADE 2 Range	GRADE 2 Median	GRADE 5 Mean	GRADE 5 Standard Deviation	GRADE 5 Range	GRADE 5 Median
Problem Types	4.2	1.5	0-7	∿ 4	3.6	1.8	0-7	∿ 3
Operations	2.8	1.3	0-5	∿ 2	3.7	1.5	0-6	∿ 3,4
Special Skills	3.0	2.2	0-8	∿ 2	2.4	2.2	0-8	∿ 1
	N=40				N=54			

Second grade teachers introduced and reviewed an average of about ten decoding skills during the two weeks, while fifth grade teachers introduced and reviewed about eight skills. Individual teachers varied considerably in the numbers of specific skills taught from time one to time two. The differences may reflect either changes in curricular emphasis or in pupil needs.

The numbers of skills introduced and reviewed seemed to have little proportional relationship to the time spent teaching within a skill area. Second grade teachers, for example, reported spending about twice as much time teaching decoding skills as did fifth grade teachers. The numbers of actual skills taught, however, do not appear that different (ten skills and eight skills). The amount of time teachers spent teaching a particular skill area did not seem to circumscribe the number of skills taught within that time. As was the case in time spent, it appears that there was greater grade level variation in number of skills taught in reading than there was in mathematics.

Teachers were also asked to indicate in the Program Overviews which specific skills would not be taught during the school year, either because "pupils already know these skills" or "these skills are taught at a higher level." The average numbers of skills teachers did not plan to teach were fractional in both reading and mathematics (Tables 7 and 8). Seventy and 88 percent respectively of the second grade teachers did not mark a skill in either decoding or vocabulary which they planned to omit from their teaching. The range in number of specific reading skills teachers indicated would not be taught

Table 7

Teacher Reported Frequencies of Specific Reading Skills Not Taught: Grades Two and Five

Frequency	GRADE 2 Mean	GRADE 2 Standard Deviation	GRADE 2 Range	GRADE 2 % Reporting Zero	GRADE 5 Mean	GRADE 5 Standard Deviation	GRADE 5 Range	GRADE 5 % Reporting Zero
Decoding	.5	.9	0-4	70	2.5	3.5	0-13	[illegible]6
Vocabulary	.3	.9	0-3	88	.9	1.2	0- 3	[illegible]2
Comprehension	.8	1.2	0-5	63	1.0	1.6	0-10	46
Application	1.5	1.7	0-6	38	1.3	2.5	0-12	61
	N=40				N=54			

Table 8

Teacher Reported Frequencies of Specific Mathematics Skills Not Taught: Grades Two and Five

Frequency	GRADE 2 Mean	GRADE 2 Standard Deviation	GRADE 2 Range	GRADE 2 % Reporting Zero	GRADE 5 Mean	GRADE 5 Standard Deviation	GRADE 5 Range	GRADE 5 % Reporting Zero
Problem Types	1.0	.8	0-3	27	1.0	1.3	0-5	48
Operations	1.6	1.1	0-5	17	.9	1.2	0-5	56
Special Skills	.9	1.3	0-6	51	.8	1.1	0-4	57
	N=41				N=54			

varied by grade level. Second grade teachers checked from zero to four decoding skills that would not be taught (70 percent indicated zero), while fifth grade teachers reported ranges from zero to thirteen skills (46 percent indicated zero).

The skills lists in the Reading Diaries and Program Overviews represented a crude hierarchy, from "symbol-sound relationships" in decoding to "recognizing facts and opinions" in the application list. There was, however, a considerable degree of overlap. Decoding skills also included more complex structural skills such as compound words, root words, prefixes, suffixes, and contractions. Application skills ranged from alphabetizing and understanding directions to the complex cognitive tasks of evaluating and synthesizing materials. The hierarchy of skills is perhaps a parsimonious explanation for why more fifth grade teachers indicated that they planned to omit none of the application skills (61 percent indicated zero) than did second grade teachers (38 percent). However, it does not explain the range of the number of skills in application (range zero to 13), comprehension (range zero to ten), and decoding (range zero to 12) that fifth grade teachers indicated they did not plan to teach during the school year.

The relationship of teacher reported frequencies of skills "to be taught" and "not to be taught" to pupil skill growth in those skill areas is described later in the report. However, some future analysis might include the examination of the patterns of skills teaching planned by teachers -- those to be taught and not to be taught -- as variations in teacher performance that might relate to pupil attributes as well as to skill growth.

The three areas of academic emphases in the classroom, use of teaching time in reading and mathematics, the reported frequency of skills taught, and the reported frequency of skills not planned to be taught, all support the generalization that there is greater emphasis and variation in approaches to teaching reading than there is to teaching mathematics.

The Quality of the Teaching Methodology

The quality of the teaching methodology was estimated by rating the responses of teachers to two open-ended questions. Teachers were asked to describe the teaching strategies, pupil activities, and materials used for those skills they (1) introduced and emphasized, or (2) reviewed and emphasized during a given week of instructional activities. Skills introduced and skills reviewed in combination were thought of as the skills a teacher actually taught. Means and standard deviations are shown in Tables 9 and 10.

The Complexity of the Organizational Structure in the Classroom

Organizational structure included two general types of information about the project classrooms. Teachers reported how they grouped children for reading and mathematics instruction, and what proportion of the pupils were taught reading or mathematics only by themselves. The ratio of teaching adults to children was also ascertained for both subject areas.

Organizational patterns of pupils for instruction. The most striking contrast in the ways teachers organized pupils for instruction in reading and mathematics was the much larger proportion of teachers who reported simultaneous instruction of all pupils in mathematics

Table 9

Ratings of the Quality of Teaching Methodology Reported by Second and Fifth Grade Teachers: Skills Introduced

	Grade 2			Grade 5		
	Mean	Standard Deviation	Number	Mean	Standard Deviation	Number
Reading	3.8	1.7	40	3.3	1.8	54
Mathematics	3.9	1.5	40	3.9	1.6	54

Table 10

Ratings of the Quality of Teaching Methodology Reported by Second and Fifth Grade Teachers: Skills Reviewed

	Grade 2			Grade 5		
	Mean	Standard Deviation	Number	Mean	Standard Deviation	Number
Reading	3.9	1.4	40	3.3	1.7	54
Mathematics	3.7	1.5	40	3.6	1.7	54

(Tables 11 and 12). Slightly under one-half of both the fifth and second grade teachers taught mathematics to all pupils at the same time, while only about one-tenth of the teachers at each grade level reported simultaneous reading instruction.

Organizing children in groups based on their reading level was the most common organizational pattern for reading instruction at both grade levels. Individualized instruction was not a preferred organizational strategy of many teachers in either reading or mathematics. Neither was grouping pupils based on skill needs a preferred organizational strategy of many teachers in both grades and both subjects.

Teachers were asked to indicate the one organizational pattern that most nearly approximated what they did. The percentages reported in the two tables do not add to 100. Teachers, being individualists, responded in a variety of ways. Most indicated one choice. However, some indicated that they used several or all of the organizational strategies.

We elected to reflect the information as teachers reported it with any inconsistencies that existed. There were several ways we could have made the data neater. (The responses of teachers who indicated more than one choice could have been deleted from the analysis, for example.) Had we done so, for this year of hypothesis generation and instrument development, the data might have been less rich and readers would have been less aware of the problems inherent in the collection and analysis of this kind of performance information. Opting for including the ambiguities was more of a problem in terms of

Table 11

Teacher Reported Organizational Patterns by Percentage of Pupils for Reading Instruction: Grades Two and Five

	Grade 2		Grade 5	
	Percentage	Number	Percentage	Number
Simultaneous	9.8	4	11.1	6
Grouped By Reading Level	68.3	28	63.0	34
Group by Skill Needs	22.0	9	22.2	12
Individualized	22.0	9	29.6	16
Other	7.3	3	16.7	9
		N=41		N=54

Table 12

Teacher Reported Organizational Patterns by Percentage of Pupils for Mathematics Instruction: Grades Two and Five

	Grade 2		Grade 5	
	Percentage	Number	Percentage	Number
Simultaneous	43.9	18	46.3	25
Grouped by Math Level	31.7	13	24.1	13
Group By Skill Level	19.5	8	25.9	14
Individualized	26.8	11	13.0	7
Other	26.8	11	31.5	17
		N=41		N=54

reporting the total population of second grade teachers or of fifth grade teachers than it was for describing a single teacher. When each teacher's responses were related to the performance outcomes of his or her pupils, as they are in a later section of this report, the problem is obviated.

The utilization of human resources in the classroom. More fifth grade pupils were taught reading and mathematics exclusively by their teacher than were second grade pupils (Table 13). The figures are somewhat crude approximations, since teachers were asked to indicate the percentage closest to their practice from a list (100, 75, 66 2/3, 50, 33 1/3, 25, 20, 10, 5, and 0%), rather than to record the exact percentage taught.

Table 13

Second and Fifth Grade Teacher Reports of Percent of Pupils Taught by the Teacher Only: Reading and Mathematics

	Grade 2			Grade 5		
	Mean	Standard Deviation	Number	Mean	Standard Deviation	Number
Reading	63.6	38.1	40	85.4	29.0	50
Mathematics	65.8	42.7	40	84.7	27.0	53

Teachers who indicated less than 100 percent were asked to identify the types of persons who taught the rest of the children. (The list included aide, volunteer, principal, resource teacher, intern, student teacher, speech teacher, reading specialist, team teacher, other pupils, and an open ended option.) Teachers were asked to have each adult (paid or volunteer), who worked in the classroom during the week the Work Diaries were maintained, complete the Reading and Mathematics Work Diary for Paraprofessionals and Other Teaching Adults in the Classroom (RMWD). The number of RMWD's completed in each classroom was counted, and then examined to determine if the classroom assistants participated in reading activities, mathematics activities, or both.

Second grade teachers utilized up to six teaching adults during reading instruction, and up to five during mathematics. Fifth grade teachers who shared teaching or preparation responsibilities did so with a maximum of one or two other adults. The ratio of adults to children, including the teacher, varied a good deal. In reading, the extremes were one adult to 28 pupils compared to one adult to two pupils; in mathematics, the extremes were one adult to 28 pupils and one adult to four pupils.

Each of the categories of information in the organizational structure of the classroom, organizational patterns of pupils for instruction, and the utilization of human resources in the classroom will be related to pupil achievement in later sections of this report.

The Variety and Types of Instructional Materials Used in Reading and Mathematics Programs

Teachers were asked in the Reading and Mathematics Program Overviews to approximate the percentage of their reading and mathematics programs in which they used the types of materials listed. The teachers were provided with a list of twelve different types of reading materials and ten different types of mathematics materials. Space was provided to specify the exact materials used and to indicate any types not included in the lists.

Teachers did not always indicate percentage usage. A few used percentages and then checked some of the other materials. A few simply checked materials they used. Percentages did not always add to 100. Some teachers commented that they used several kinds of materials simultaneously with different groups of children, and that caused their usage figures to add to well over 100 percent. Most teachers, however, did provide a percentage breakdown of materials used. The information tabularized in Tables 14 and 15 was derived by counting a material as "used" whether it was indicated by a check mark or by a percentage figure. The proportional patterns of usage of material was lost in that process, but was retained for the analytical processes in the sections of this report detailing individual teacher practice and pupil skill growth. Tables 14 and 15 reflect the lists of materials as they appeared in the Program Overviews. The tables indicate the number and percentage of teachers who used each type of material. Second grade teachers used basal readers more than did the fifth grade teachers, who relied more on individualized materials and reading kits.

Table 14

Number and Percent of BTES Teachers Using Different Types of Materials for Reading Instruction

Material	Grade 2 (N=40)		Grade 5 (N=53)	
	N	%	N	%
Basal reader-state adoption	30	75	36	68
Basal reader-other	31	78	24	45
Individualized materials	22	55	41	77
Programmed materials	13	33	14	26
Taped programs	12	30	15	28
Reading kits	11	28	25	47
Teacher-made materials	25	63	35	66
Games	30	75	27	51
Newspapers	9	23	28	53
Reading workbooks that accompany a basal text	35	88	37	70
Other reading or phonics workbooks	17	43	17	32
Additional materials	23	58	23	43

Table 15

Number and Percent of BTES Teachers Using Different Types of Materials for Mathematics Instruction

Material	Grade 2 (N=39)		Grade 5 (N=54)	
	N	%	N	%
Mathematics text-state adoption	34	87	43	80
Mathematics text-other	15	38	21	39
Individualized materials	16	41	26	48
Programmed materials	7	18	18	33
Taped programs	2	5	9	17
Mathematics kits and manipulation materials	16	41	26	48
Teacher-made materials	34	87	38	70
Games	32	82	41	76
Mathematics workbooks that accompany a basal text	13	33	11	20
Other mathematics workbooks	9	23	14	26

Our particular sample of teachers may not be typical of "teachers in general" in their reported usage of basal texts in reading. Seventy-five and 78 percent of the Phase II second grade teachers used some kind of a basal text; less than 70 percent of the fifth grade teachers used basal texts. Previous national and regional surveys of the materials used in elementary school reading instruction reported a much higher incidence of basal text usage. Austin and Morrison found only one school system out of 1,023 elementary schools where basal readers were not used as the "major tools of reading instruction".[3] Barton and Wilder reported that 98 percent of the 1,500 first grade teachers in their study used basal readers on all or most days.[4] In a 1969 study of public schools in New England, 95 percent of the principals said that basal readers were used as a basis in the reading programs of their schools.[5] The studies are old and not directly linked to second or fifth grade. Practices in basal text usage may have changed. However, it is possible that the Phase II teachers were an unusual sample, or that the sample may accurately reflect current practice in California.

Second grade teachers reported the use of reading games more often than did fifth grade teachers, and the reverse was reported for the use of newspapers. There was little percentage difference between second and fifth grade usage of the ten types of mathematics instructional materials. Second grade teachers tended to use teacher-made materials and workbooks more than did fifth grade teachers.

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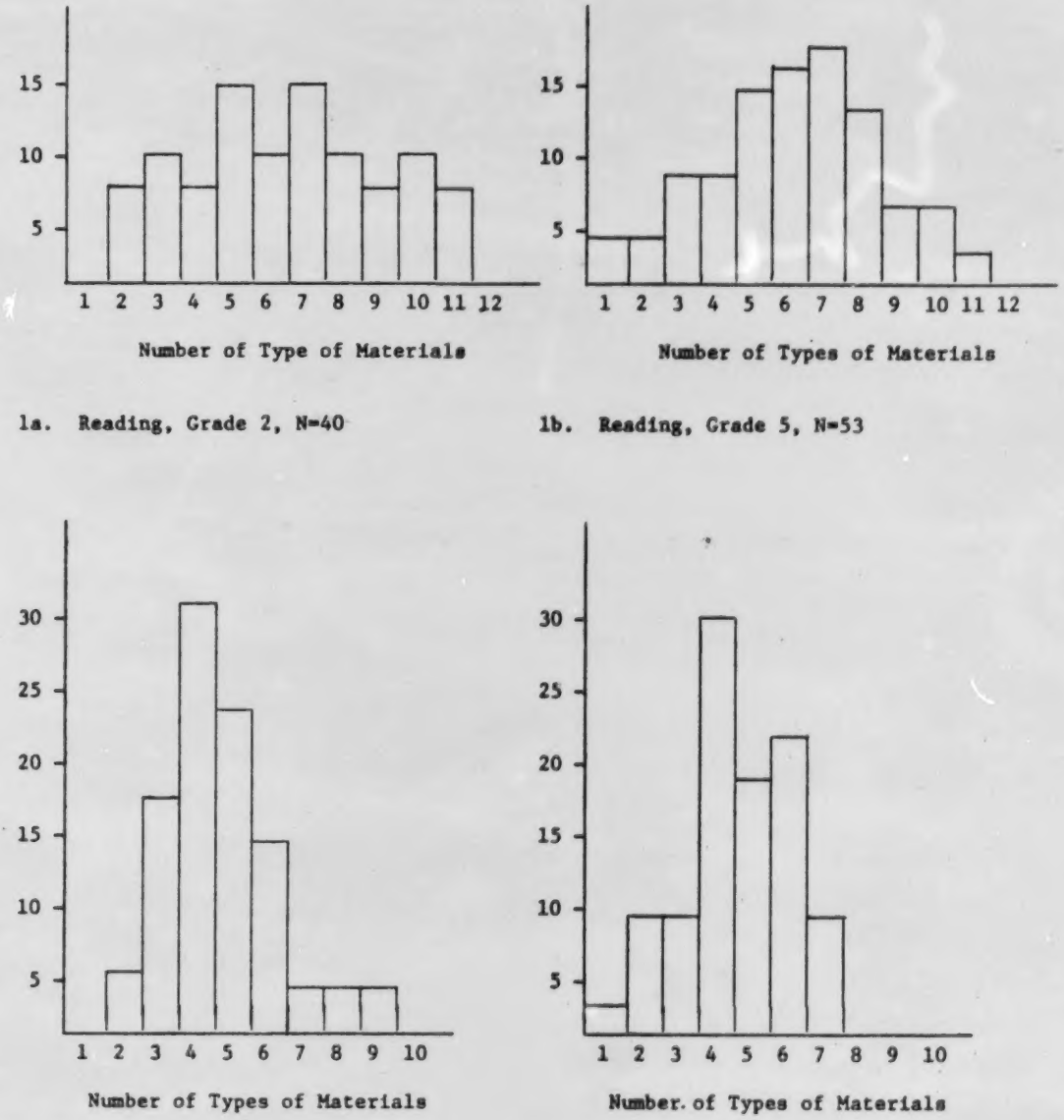
[3]Austin and Morrison, 1963, p. 54.
[4]Barton and Wilder, 1964.
[5]New England Educational Assessment Project, 1969, p. 16.

Teacher use of materials is depicted a different way in Figure 2. The number of types of materials checked by each teacher was counted. The histograms suggest that patterns of reading materials usage vary between grade levels. There was little modal tendency in the numbers of different types of materials used by second grade teachers. The histograms representing the percentages of teachers using different numbers of materials in mathematics are more similar across grade levels.



1a. Reading, Grade 2, N=40

1b. Reading, Grade 5, N=53

1c. Mathematics, Grade 2, N=39

1d. Mathematics, Grade 5, N=54

Figure 2. Number and types of materials in reading and mathematics in Grades 2 and 5.

Validity Indicators

The Work Diaries were one of several approaches to describing teaching performances in the project. The study of teaching performances was also addressed by direct observation and by video-taping in the classrooms. The validity of teacher reports of their activities will be explored in comparison to selected observational variables and in terms of pupil achievement. The three ways that the validity of teacher reports will be considered are:

1) Teacher reports about the organization of pupils for reading and mathematics instruction will be compared with observed classroom organizational patterns;
2) Teacher reports of time spent teaching specific reading and mathematics skills will be compared with observed incidence of positive pupil learning; and,
3) Teacher reports of instructional activities, grouping and materials used will be compared with pupil achievement in reading and mathematics.

Our purpose was to determine if reports provided by teachers related to other information obtained in the study, since conventional tests of reliability could not be done for fairly obvious reasons; the Work Diaries were survey instruments. To obtain correlations among equivalent forms (the two collections of Diary information) was not appropriate because teachers could be expected to engage in quite different teaching activities at two different points in time. Relationships among subdivisions of instruments were not examined because of the differences in the content of the various

parts.[6] What has been done is a variation on the shibboleth that reliability establishes the bounds of validity. In this section, indicators of validity might be thought of as estimates of the reliability of teacher reports. The relationships we will be testing are shown graphically in the model in Figure 3.

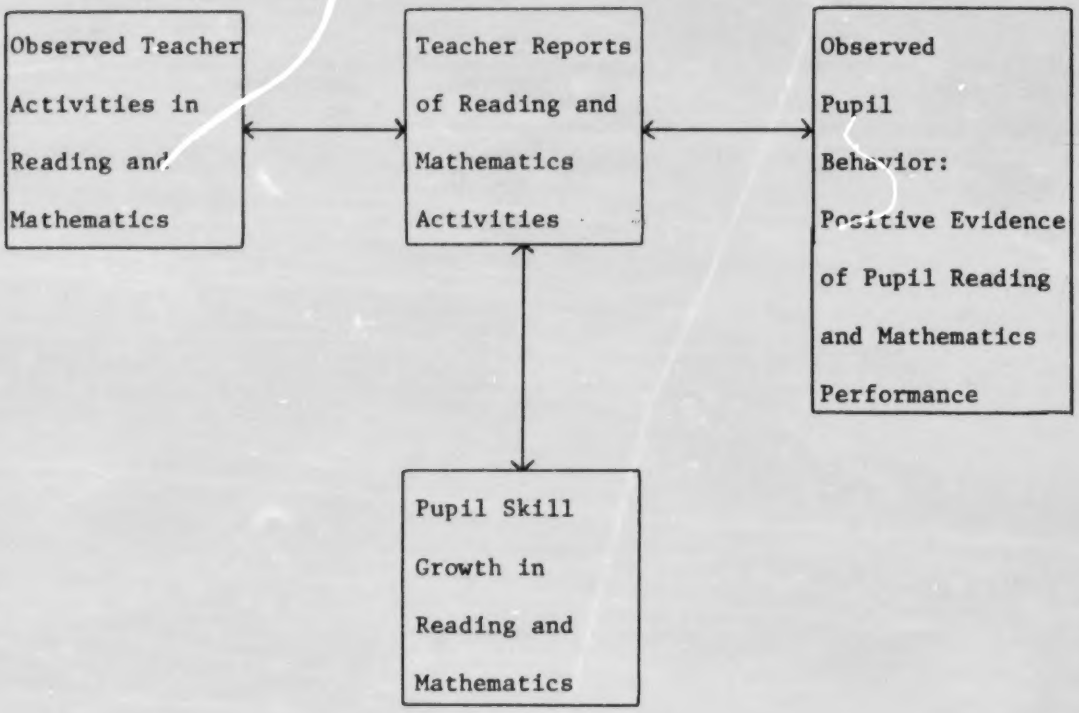


Figure 3. Model for the testing of indicators of validity.

A different statistical treatment of combined categories of the teacher reported information is described in Volume I of the final

[6]Accuracy of scoring was assured by the 100 percent verification of the scoring of each instrument.

report. In the company of the presumably "more objective" observational data, some of the teacher reported information survived as statistically significant through successive types of analyses. That also might be thought of as an estimate of the accuracy of the teacher reports.

Observed and Teacher Reported Organization of Pupils for Learning

One of the two observational systems utilized to gather Phase II data was APPLE[7] (Anecdotal Processing to Promote the Learning Experience), a system in which observers generated a low inference record of teacher and pupil behavior. Among the information observers recorded was a continuous record of instructional contexts in which the sample of target pupils were working during reading and mathematics instruction. In the APPLE System:

> ...The concept of an instructional context defines the relationship of the teacher to the instructional activity of the pupil. There are six major contexts, ranging from the teacher directing the activities of the entire class to an individual student working or playing independently of the teacher's direction and independently of other children in the class. (Volume III, Chapter 1)

The APPLE lexicon definitions of the six contexts are shown in Figure 4. They are general definitions. For the analyses discussed in this section, only those observer descriptions of pupils specifically working in reading or in mathematics contexts were included.

Eight target pupils were identified for observation in each classroom. Pupils and appropriate alternates were selected by

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[7]APPLE was developed by Nadine Lambert of the University of California, Berkeley. It is described in its application to this project in Chapter One of Volume III.

ADULT-GROUP:	The class is divided into groups and an adult other than teacher is directing the activity of the group in which the child being observed is participating.
INDEPENDENT-CLASS:	The entire class is working or playing independently of the teacher's direction. Teacher usually present but not directing.
INDEPENDENT-GROUP:	The group of students in which the child being observed is participating is working or playing independently of the teacher's direction.
INDEPENDENT-INDIVIDUAL:	The student being observed is working or playing independently of the teacher's direction and also independently of the rest of the class.
TEACHER-CLASS:	Teacher is directing the activity and the entire class is participating.
TEACHER-GROUP:	The class is divided into groups and the teacher is directing the activity of the group in which the child being observed is participating.

Figure 4. APPLE lexicon definition of selected contexts.

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comparing teacher rankings of expected pupil performance with the actual fall reading performance on one or more of the Phase II tests. A boy and a girl were selected from the top, from just above the middle, from just below the middle and from the bottom of the distributions in each classroom. The list was also balanced to reflect the ethnic composition in each classroom.[8] The analyses in this section of the report compare the observed activities of that sample of less able, average and above average pupils in each classroom with teacher reported activities.

Teachers were asked to indicate in the Work Diaries which one organizational pattern most nearly described their current reading program. Their choices were: simultaneous instruction of all pupils, pupils grouped by reading level, pupils grouped by skill needs, individualized instruction and an open-ended "other" category. The four specific organizational patterns reported are compared with the six instructional contexts in which pupils were observed to be working (Tables 16, 17, 18 and 19).

The second grade teachers (Table 16) who reported simultaneous reading instruction for all pupils were observed teaching the entire class (correlation of .57 at the .01 level of significance). It is interesting to note that reported simultaneous instruction was also associated with observed group instructional activities led by an adult other than the teacher (Adult-Group context). Reported grouping by reading level (the preferred organizational strategy in reading of

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[8]The selection process for target pupils is described more fully in Volume II.

Table 16

Correlation of Teacher Reported Organization of Pupils for Reading Instruction with Observed Organization for Reading Instruction: Second Grade

Work Diary Organizational Categories	APPLE Contexts					
	Independent-Class	Independent-Group	Independent-Individual	Teacher-Class	Teacher-Group	Adult-Group
Simultaneous	NS*	-.31(.03)**	NS	.57(.01)	NS	.26(.05)
Grouped-Reading Level	NS	.32(.03)	-.38(.01)	-.23(.08)	.36(.01)	NS
Grouped-Skill Need	NS	NS	NS	NS	NS	.28(.04)
Individualized	.25(.07)	-.33(.02)	.35(.02)	NS	NS	NS

* Not significant
** Parenthetical figure is level of significance

Table 17

Correlation of Teacher Reported Organization of Pupils for Reading Instruction with Observed Organization for Reading Instruction: Fifth Grade

Work Diary Organizational Categories	APPLE Contexts					
	Independent-Class	Independent-Group	Independent-Individual	Teacher-Class	Teacher-Group	Adult-Group
Simultaneous	NS*	NS	NS	NS	NS	NS
Grouped-Reading Level	-.31(.01)**	.25(.04)	-.21(.07)	NS	.29(.02)	-.25(.04)
Grouped-Skill Need	NS	NS	NS	NS	NS	.35(.01)
Individualized	.39(.01)	-.31(.02)	.24(.05)	NS	-.23(.05)	NS

* Not significant
** Parenthetical figure is level of significance

Table 18

Correlation of Teacher Reported Organization of Pupils for Mathematics Instruction With Observed Organization of Mathematics Instruction: Second Grade

Work Diary Organizational Categories	APPLE Contexts					
	Independent-Class	Independent-Group	Independent-Individual	Teacher-Class	Teacher-Group	Adult-Group
Simultaneous	NS*	-.24(.07)**	-.28(.04)	.47(.01)	-.39(.01)	NS
Grouped-Math Level	NS	.35(.02)	NS	-.32(.03)	NS	.32(.02)
Grouped-Skill Needs	NS	NS	NS	NS	NS	.26(.06)
Individualized	.42(.01)	-.28(.04)	.45(.01)	-.29(.04)	NS	NS

* Not significant
** Parenthetical figure is level of significance

Table 19

Correlation of Teacher Reported Organization of Pupils for Mathematics Instruction With Observed Organization of Mathematics Instruction: Fifth Grade

Work Diary Organizational Categories	APPLE Contexts					
	Independent-Class	Independent-Group	Independent-Individual	Teacher-Class	Teacher-Group	Adult-Group
Simultaneous	NS*	-.33(.01)**	NS	.33(.01)	NS	NS
Grouped-Math Level	-.26(.04)	NS	NS	NS	.28(.03)	NS
Grouped-Skill Needs	-.23(.06)	.36(.01)	NS	-.19(.10)	NS	.28(.03)
Individualized	NS	NS	.27(.04)	NS	-.22(.07)	.35(.01)

* Not significant
** Parenthetical figure is level of significance

most second and fifth grade teachers) correlated both with observed group instruction of pupils and with pupils observed to be working independently on group assignments (Teacher-Group and Independent-Group contexts). It is interesting to note that in classrooms where teachers reported grouping by skill needs, the only correlation with APPLE contexts was where an adult other than the teacher was observed working with groups of pupils (Adult-Group context). As reflected in the negative correlations, teachers who reported group instruction were not those observed to have children working individually on independent assignments, nor were they those who reported simultaneous instruction. Second grade teachers who reported using individualized instruction as a preferred organizational strategy were, in fact, observed to have children working independently on individual assignments, and were not observed to have children working independently on group assignments.

However, a positive relationship emerged between the observation of the whole class working on the same assignment independently of the teacher (Independent-Class context), and a teacher report of individualized instruction. This seeming inconsistency could be explored either by further work with teachers to see how they define "individualized instruction" or by reviewing the original observational data to see what materials were being used and how they were being used by the target pupils in that context. With the possible exception just noted, there was considerable consistency between the reports of second grade teachers about the way their reading activities were structured and the way those activities were observed to be structured. The positive and negative correlations are where they would be logically expected.

The same patterns are generally true for fifth grade (Table 17). Pupils of teachers who reported grouping pupils by general reading level were observed to be instructed by their teacher in groups and at work independently on group assignments. Again, the positive relationship between the whole class observed to be working on the same assignment independently of the teacher and the teacher report of individualized instruction emerged. The patterns of use of adults other than the teacher is interesting at both grade levels. Where teachers reported grouping by skill needs, an adult other than the teacher was observed working with children. At fifth grade, a negative correlation emerged between reported grouping by general reading level and the use of other adults; fifth grade teachers who group by reading level, the preferred organizational style, are not the same teachers observed using other adults to instruct children.

The reported organization of second grade mathematics instruction again was consistent with observed patterns of pupil and teacher activities (Table 18). In second grade mathematics, as in reading at both grade levels, the positive relationship between the observation of all pupils in a class working independently on the same assignment and teacher reported individualized instruction appeared. The pattern of teachers using other adults in relationship to grouping children for specific skill needs emerged in second grade mathematics as it did at both grade levels in reading. In mathematics, however, adults other than the teacher were observed working with groups of children in classrooms where teachers reported grouping pupils by general mathematics level as well.

Fifth grade reported grouping in mathematics was consistent with observed grouping: teachers who reported simultaneous instruction of the whole class were observed instructing the whole class; teachers who reported grouping pupils were observed to be instructing groups of pupils and their pupils were observed to be working independently on group assignments; and, teachers who reported individualized instruction had pupils who were observed to be working independently on individualized assignments (Table 19). Again, fifth grade teachers who reported individualized instruction and grouping by specific skills needs were observed to have adults other than the teacher work with pupils.

During reading and mathematics activities at both grade levels adults other than the teacher were observed working in classrooms where teachers reported that their preferred method of grouping was to group instructionally for specific skill need. Only about one-third of the second grade teachers and about fifteen percent of the fifth grade teachers did not teach reading and mathematics to all of their pupils themselves. Therefore, we are discussing a relatively small proportion of the teachers. Teachers were not observed (to a degree where significant correlations emerged) teaching groups of pupils in classrooms where they reported grouping by skill level. It appears that teachers who use other adults as instructors frequently assign the major responsibility for specific skill instruction to the other teaching adults.

Some support for that generalization was adduced by examining teacher responses to the open-ended question in the Program Overviews: "How do you select the children with whom the resource person (or

persons) works?" Examples from the Reading Program Overviews give an indication of this practice.

> ...children who need special help ...[resource persons used: aide, peer tutors, older pupil tutors, and team teachers]
>
> ...The three children who need help in reading. Slow readers who improve with practice in oral reading and need someone to listen to them...[resource persons used: volunteer, older pupil tutors]
>
> ...Those I feel need extra help... [resource person used: high school tutor]
>
> ...Those whose skills need additional practice. Also those who have been sick or out of school and have missed work...[resource person used: volunteer]
>
> ...I select children who cannot work independently and those that are distractable to a great degree. These children are usually reading on a pre-primer level... [resource persons used: aide, student teacher, reading specialist, older pupils]
>
> ...Basically, they are children who need extra assistance in recalling words, understanding phonics or comprehending story details. A few get extra work in logical thinking... [resource persons used: aide, volunteer and older pupils]
>
> ...I've selected four children who are very slow to be aided because they have to be guided closely... [resource persons used: aide and volunteer]
>
> ...Students needing special individual help... [resource person used: volunteer]
>
> ...Those who need extra help or who have been absent also go to adult volunteers...
>
> ...Group of four slower readers... [resource person used: volunteer]
>
> ...Five lowest students, based on test and observation to volunteer. Ten top students go to teacher...

The teachers' reports are quite consistent; children who need special help are frequently assigned to someone other than the teacher for this special help. Embedded here are several intriguing issues that could be explored. Do some teachers assign pupils with special

skill needs to other adults exclusively or for help beyond that provided by the teacher? What is the impact on pupil performance?

The first indicator we have examined of the validity of a teacher's reports of his or her own activities was productive. Observed and teacher reported organization of pupils for learning seem to be consistent to the degree that further research would be warranted to refine systems for teachers to report their own organizational strategies.

Observed Incidence of Specific Kinds of Positive Pupil Learning and Teacher Reported Time Spent Teaching Related Reading and Mathematics Skills

Teachers estimated the amount of time they spent teaching four kinds of reading skills: decoding, vocabulary, comprehension and application. APPLE observers rated, as well as recorded, pupil activities during reading and mathematics instruction. Of the pupil "events" which occurred frequently enough to be included in the APPLE analytical phases of the study, it appeared that two of the reading event categories might relate to two of the Work Diary categories. To test those assumptions the observational evidence of positive pupil performance in the demonstration of phonics skills was compared to the Work Diary reports of the time each teacher spent teaching decoding skills; and, the observed evidence of positive pupil performance in reading comprehension was compared to reports of time spent teaching comprehension skills (Table 20).

The APPLE lexicon definition of a "+ phonics skills" pupil event, for example, is "positive evidence of skill in sounding out

new words; knowing the sound connected with letters." If observers had any doubt about the quality of a pupil activity, they were trained to rate it as a "0" or neutral event. Only the "+" or positive incidences of pupil performance were used in this analysis.

The observed incidence of positive pupil performance during mathematics in number concept skills was compared to the two potentially related Work Diary categories, the time reported teaching problem types and the time reported teaching operations (Table 21). At the fifth grade level the correlations do suggest that teacher reported amounts of time spent in direct instruction of specific reading and mathematics skills was related to observed evidence of successful pupil performance in those skill areas.

The second test of the validity of teacher reports was a comparison of the reported time spent teaching specific reading and mathematics skills compared with observed evidence of pupil demonstrations of those skills, at best an oblique index of validity. The correlations were small and the levels of significance approached the liberal .10 level arbitrarily set by the authors as the cut off point for these analyses. Nevertheless, the reports of teachers about time spent teaching specific skills appeared to be reflected in evidence of pupil skills in those areas.

Teacher Reports of Preparation and Instructional Activities, Grouping Pupils for Instruction and Materials Usage Compared With Pupil Achievement in Reading and Mathematics

The indicators of validity that will be examined in this section of the report are whether any of several varieties of teacher reported

Table 20

Correlations of Teacher Reported Time Teaching Specific Reading Skills with Observed Positive Evidence of Pupil Learning of Those Skills: Second and Fifth Grade

Work Diary Reported Teaching Time	APPLE PUPIL EVENTS			
	Second Grade		Fifth Grade	
	Plus Phonic Skills	Plus Reading Comprehension Skills	Plus Phonic Skills	Plus Reading Comprehension Skills
Decoding Skills	NS*	NS	.19(.10)**	NS
Comprehension Skills	NS	NS	NS	NS

* Not significant
** Parenthetical figure is level of significance

Table 21

Correlations of Teacher Reported Time Teaching Specific Mathematics Skills with Observed Positive Evidence of Pupil Learning of Those Skills: Second and Fifth Grade

Work Diary Reported Teaching Time	APPLE PUPIL EVENTS	
	Second Grade	Fifth Grade
	Plus Number Concept Skills	Plus Number Concept Skills
Problem Types	NS*	.21(.08)**
Operations	NS	NS

* Not significant
** Parenthetical figure is level of significance

information related to growth in pupil performance as measured by the Phase II pupil test battery. Teacher reported variables were examined in relation to pupil performance in the spring adjusted for the same pupil's performance in the fall on the criterion variables in reading and mathematics. This statistical technique, partial correlation, allows the researcher to calculate a measure of association between two variables while adjusting for the effects of one or more additional or control variables.

The Phase II pupil battery is described in detail in Volume IV of this final report. Reading measures of achievement, comprehension, application and decoding skills were obtained for pupils in the fall and in the spring of the study. Measures of mathematics concepts, computation and application skills were also collected. Pupil scores on each of these measures and the total reading and total mathematics scores, controlled for entry level skills, were the criterion measures to which selected teacher reports of activities have been compared. All pupils for whom fall and spring scores were obtained on any single criterion measure were included for this analysis. The teacher activities included in the analysis for both reading and mathematics were preparation time, total direct teaching time, the time spent teaching specific skills, the percentage of pupils taught only by their teacher, the frequency of teaching and not teaching specific skills, and the preferred strategy for the organization of pupils for instruction.

The time spent preparing to teach reading was not significantly related to any pupil reading performances except inversely to reading comprehension skills at the fifth grade level (Tables 22 and 23). We did not ask teachers to report what specific skills they were spending

Table 22

Correlation Coefficients Between Teacher Variables and Spring Pupil Test Scores Partialling Out Fall Test Scores: Grade Two Reading

	PUPIL SCORES				
Work Diary Variables	CAT Reading	Application	Decoding	Achievement	Reading: Total
Teacher Preparation Time	NS*	NS	NS	NS	NS
Total Direct Teaching Time	NS	NS	.36(.04)	NS	NS
Specific Skill: Teaching Time					
Decoding	NS	NS	NS	NS	NS
Vocabulary	NS	NS	NS	NS	NS
Comprehension	NS	NS	NS	NS	NS
Application	NS	NS	NS	NS	NS
Percent Pupils Teacher Taught	NS	.39(.03)	.38(.02)	NS	.38(.03)
Specific Skills: Frequency of Teaching					
Decoding	NS	NS	NS	NS	NS
Vocabulary	NS	NS	NS	NS	NS
Comprehension	NS	NS	NS	NS	NS
Application	.32(.06)**	NS	NS	NS	NS
Specific Skills: Not Taught					
Decoding	NS	NS	-.34(.04)	NS	NS
Vocabulary	NS	NS	-.31(.06)	NS	NS
Comprehension	NS	NS	NS	NS	NS
Application	NS	NS	NS	NS	NS
Quality of Teaching Methodology					
Skills Introduced	NS	NS	NS	NS	NS
Skills Reviewed	NS	NS	NS	NS	NS
Organization of Classroom					
Simultaneous	NS	-.29(.09)	.30(.08)	NS	NS
Grouped by Reading Level	NS	.59(.01)	NS	NS	NS
Grouped by Skill Needs	NS	NS	NS	NS	NS
Individualized	NS	-.37(.03)	NS	NS	NS

* Not significant
** Parenthetical figure is level of significance

Table 23

Correlation Coefficients Between Teacher Variables and Spring Pupil Test Scores Partialling Out Fall Test Scores: Grade Five Reading

Work Diary Variables	PUPIL SCORES				
	CAT Reading	Application	Decoding	Achievement	Reading: Total
Teacher Preparation Time	-.28(.07)**	NS	NS	NS	NS
Total Direct Teaching Time	NS*	NS	NS	NS	NS
Specific Skill: Teaching Time					
Decoding	-.39(.01)	-.30(.05)	NS	-.33(.03)	-.43(.01)
Vocabulary	-.32(.04)	NS	NS	-.31(.04)	NS
Comprehension	NS	NS	NS	NS	NS
Application	NS	NS	-.34(.03)	NS	NS
Percent Pupils Teacher Taught	NS	NS	NS	.30(.05)	NS
Specific Skills: Frequency of Teaching					
Decoding	NS	NS	NS	NS	NS
Vocabulary	NS	NS	NS	NS	NS
Comprehension	NS	NS	NS	NS	NS
Application	NS	NS	NS	NS	NS
Specific Skills: Not Taught					
Decoding	NS	NS	NS	NS	NS
Vocabulary	NS	NS	NS	NS	NS
Comprehension	NS	NS	NS	NS	NS
Application	NS	NS	NS	NS	NS
Quality of Teaching Methodology					
Skills Introduced	NS	NS	NS	NS	NS
Skills Reviewed	NS	NS	NS	-.29(.05)	NS
Organization of Classroom					
Simultaneous	NS	.43(.01)	NS	NS	.32(.03)
Grouped by Reading Level	NS	NS	-.24(.10)	NS	NS
Grouped by Skill Needs	NS	NS	NS	NS	NS
Individualized	NS	NS	NS	NS	NS

* Not significant
** Parenthetical figure is level of significance

time preparing to teach. Future research might include more detailed study on the time allocated to preparation for teaching specific skills.

The total time teachers spent in the direct teaching of reading was related to pupil decoding skill growth at the second grade level. The amount of time teachers reported teaching specific reading skills, including decoding skills, was not related to pupil skill growth in the second grade, but some interesting patterns emerged at fifth grade. Fifth grade teachers who reported spending more time teaching the basic decoding and vocabulary skills had pupils who did less well in the comprehension, application and achievement measures. Conversely, more concentration on teaching the more sophisticated tasks of reading application skills inversely related to pupil growth in decoding skills. An hypothesis to be tested would be whether fifth grade teachers who emphasize basic decoding and vocabulary skills have a negative impact on pupil skill growth in reading comprehension. That relationship and the reverse of that pattern in the negative relationship of application skills teaching time with pupil decoding skill growth suggests a variety of research tasks which might focus on the identification of optimal ranges of time for teaching specific skills to pupils in classrooms with a variety of pupil skill configurations.

The percentage of pupils taught exclusively by the teacher related to reading skill growth at both grade levels. Where greater proportions of second grade pupils were taught solely by their teacher, pupils showed more skill growth in reading application and decoding tasks. Fifth grade pupils taught exclusively by their teacher did better in reading achivement. A variety of teaching configurations was represented in the sample: team teaching, multiple level, nongraded and open classrooms. A variety of human and school resources was available to

some teachers: aides, student teachers, volunteers, reading specialists and learning laboratories. Under the circumstances (particularly in the case of young pupils) the simple generalization that pupil skill growth in reading may relate to the proportion of pupils taught exclusively by the teacher should be studied further. Although the data gathered from the paraprofessionals and other teaching adults will not be detailed in this report, it is of considerable interest to note that variables associated with other teaching adults were consistently and significantly related to lack of pupil growth in reading and mathematics skills.

Teacher reports of the frequency of skills taught (introduced and reviewed) and skills not taught (pupils already know skills or they will be taught at a higher level) related in some instances to pupil skill growth in second grade reading. The frequency of application skills reported as taught correlated positively with second grade pupil skill growth in reading comprehension. The relationship is sensible. Application skills included "higher level" sorts of comprehension skills such as evaluating materials and ideas, recognizing facts and opinions, synthesizing ideas, interpretive reading, and creative writing. An hypothesis to be verified in future research is whether the more frequent teaching of higher level comprehension skills to second grade pupils consistently impacts on pupil skill growth in reading comprehension.

The negative correlations between teacher reports of "not" teaching decoding and vocabulary skills and pupil growth in those areas are interesting. It was reported earlier that about 30 percent of the second grade teachers checked some decoding skills that they did not intend to teach, and about twelve percent checked some vocabulary skills

that they would not teach. The remainder of the second grade teachers had no entries in the "not to be taught" columns. It appears that the decision not to teach certain decoding and vocabulary skills by a relatively small proportion of the second grade teachers had an adverse affect on the decoding and vocabulary skill growth of their pupils.

The ways in which teachers grouped their pupils for reading instruction correlated with pupil skill growth, or lack of growth on several measures at both grade levels. About ten percent of the second and fifth grade teachers reported "simultaneous" instruction as their preferred method of grouping. That kind of grouping correlated positively with second grade pupil skill growth in decoding and negatively with application skills. Simultaneous grouping at fifth grade correlated positively with pupil growth in application skills and in total reading skills.

Grouping by general reading level, the preferred organizational mode of between 60 and 70 percent of the teachers in the study, was positively correlated with growth in reading application skills of second grade pupils, and negatively correlated with fifth grade pupil growth in decoding skills. Individualized instruction was associated with a lack of growth in the application skills of second grade pupils.

The relationships suggested by the partial correlations could be, and probably are, related to the specific materials and programs used by some teachers. Some may as well be related to specific pupil characteristics. For example, it might be difficult to teach second grade children the "higher order" skills requisite in the reading application tasks with the kinds of individualized program materials used; the skills may not be represented in such materials. An alternative hypothesis is that less able seven-year old children using individualized materials

may have more difficulty acquiring those kinds of skills from materials than they would if the skills were taught directly by the teacher.

Neither teacher preparation time nor total teaching time correlated with pupil growth in mathematics skills (Tables 24 and 25). The time second grade teachers reported spent in teaching specialized skills in mathematics was negatively related to pupil growth in computation skills, and positively related to concept skill growth. The Work Diary "Specialized Skills" list included time, money, graphing, geometry, and actual and representative measurement, which are analogous to the content of the concepts test given. Second grade teachers spent less than one-third of their time, on the average, teaching specialized skills. An hypothesis to be tested would be whether a range of optimal time for teaching specialized skills to second grade pupils could be established. Perhaps too much concentration on those skills leaves little time for the practice and learning of basic computational skills.

Unlike reading, the proportion of pupils taught only by their teacher did not relate to pupil skill growth in mathematics. Teacher reports of the frequency of mathematics skills taught and not taught related to several types of pupil skill growth. For second grade pupils, more teacher emphasis on the teaching of problem types such as basic facts, terminology, and word problems, related to skill growth in mathematics application and in total mathematics. (The mathematics application test content was analogous to the Work Diary "Problem Type" skills list.) More frequent teaching of operations such as addition, subtraction, multiplication and division, related to pupil growth in

Table 24

Correlation Coefficients Between Teacher Variables and Spring Pupil Test Scores Partialling Out Fall Test Scores: Grade Two Mathematics

	PUPIL SCORES			
Work Diary Variables	Concepts	Computation	Application	Math: Total
Teacher Preparation Time	NS*	NS	NS	NS
Total Direct Teaching Time	NS	NS	NS	NS
Specific Skill: Teaching Time				
Problem Type	NS	NS	NS	NS
Operations	NS	NS	NS	NS
Special Skills	.29(.08)**	-.28(.10)	NS	NS
Percent Pupils Teacher Taught	NS	NS	NS	NS
Specific Skills: Frequency of Teaching				
Problem Type	NS	NS	.29(.08)	.28(.10)
Operations	NS	.51(.01)	.29(.08)	.51(.01)
Special Skills	NS	NS	NS	NS
Specific Skills: Not Taught				
Problem Type	.28(.09)	NS	NS	NS
Operations	NS	NS	NS	NS
Special Skills	.28(.09)	NS	-.35(.03)	NS
Quality of Teaching Methodology				
Skills Introduced	NS	NS	NS	NS
Skills Reviewed	NS	NS	NS	NS
Organization of Classroom				
Simultaneous	NS	NS	NS	NS
Grouped: Math Level	NS	NS	NS	NS
Grouped: Skill Needs	NS	NS	-.42(.01)	-.41(.01)
Individualized	NS	NS	.36(.03)	.28(.10)

*Not significant
**Parenthetical figure is level of significance

Table 25

Correlation Coefficients Between Teacher Variables and Spring Pupil Test Scores Partialling Out Fall Test Scores: Grade Five Mathematics

	PUPIL SCORES			
Work Diary Variables	Concepts	Computation	Application	Math: Total
Teacher Preparation Time	NS*	NS	NS	NS
Total Direct Teaching Time	NS	NS	NS	NS
Specific Skill: Teaching Time				
Problem Type	NS	NS	NS	NS
Operations	NS	NS	NS	NS
Special Skills	NS	NS	NS	NS
Percent Pupils Teacher Taught	NS	NS	NS	NS
Specific Skills: Frequency of Teaching				
Problem Type	NS	NS	NS	NS
Operations	NS	NS	.24(.10)	NS
Special Skills	-.30(.04)**	NS	NS	NS
Specific Skills: Not Taught				
Problem Type	NS	NS	NS	NS
Operations	NS	NS	NS	NS
Special Skills	NS	NS	NS	NS
Quality of Teaching Methodology				
Skills Introduced	NS	NS	NS	NS
Skills Reviewed	NS	NS	NS	NS
Organization of Classroom				
Simultaneous	NS	NS	NS	NS
Grouped: Math Level	NS	NS	NS	NS
Grouped: Skill Needs	NS	NS	NS	NS
Individualized	NS	NS	NS	NS

*Not significant
**Parenthetical figure is level of significance

computational and application skills and to total mathematics skill growth. (The test content of the pupil computation test was analogous to the Work Diary list of operations skills.)

Fifth grade pupils who were taught mathematics operations more frequently performed better on the mathematics application task. However, teachers who taught more specialized mathematics skills (graphing, time, money, geometry, etc.) had pupils who did less well on concepts tasks. While it is not too surprising that the pupils who are exposed to more skills training in mathematical computation (operations) might be better able to apply those skills to problems, such as those in the applications test, it is surprising that pupils who were taught more abstract skills such as geometry and graphing did not do well on the test of mathematical concepts. These contradictory results might relate to several factors. The measures used to assess pupil application and concept skills at the fifth grade level appear more similar in content to each other than they did in the second grade battery. A factor analysis of the second and fifth grade mathematics measures might begin to sort the skills in a more meaningful way. Among hypotheses that could be tested would be whether teachers who teach given mathematics skills more frequently have pupils with particular characteristics, i.e., less able; or whether teaching that is bound to particular instructional materials does not afford pupils an adequate opportunity to expand all mathematics skills. The relationships among time spent teaching specific skills, materials used and the frequency of the teaching of specific skills warrant further research efforts.

Some puzzling correlations emerged among the frequencies of skills that second grade teachers reported they would <u>not</u> teach and pupil skill

growth on some criterion measures. Not teaching problem types was associated with growth in mathematics concepts. Not teaching specialized skills was associated with growth in concepts and inversely related to growth in application skills. Over 70 percent of the second grade teachers reported that they would not teach some of the skills on the problem type list. The list included some skills perhaps not appropriate for second grade pupils (decimals and fractions, for example). About half of the second grade teachers reported that they would not teach some of the skills on the specialized skills list. Again that list included some skill areas perhaps not routinely taught in the second grade.

Classroom organization for mathematics instruction was correlated with some kinds of pupil skill growth at the second grade level. Children grouped by the need for particular skill instruction was the preferred mode of about 20 percent of the second grade teachers. That kind of grouping correlated negatively with pupil growth in application skills and on the total mathematics battery. Individualized instruction, the preferred mode of about 30 percent of the second grade teachers, was positively correlated with pupil growth in application skills and on the total mathematics battery. As in reading, the relationships suggested by the partial correlations could be related to materials used, or to the types of students with whom specific materials were used.

The partial correlations among teacher reports of materials used and pupil skill growth on the various reading and mathematics criterion measures are shown in Tables 26, 27, 28 and 29. There are correlations, sometimes negative and sometimes positive, with the use of specific

Table 26

Correlation Coefficients Between Materials Used
and Spring Pupil Test Scores Partialling Out
Fall Scores: Grade Two Reading

	PUPIL SCORES				
Work Diary Variables	CAT Reading	Application	Decoding	Achievement	Reading: Total
Basal Reader: State Adoption	NS*	.33(.06)**	NS	NS	NS
Basal Reader: Other	NS	-.43(.01)	NS	NS	-.29(.09)
Individualized Materials	NS	NS	NS	NS	NS
Programmed Materials	NS	NS	NS	NS	NS
Taped Materials	NS	NS	NS	NS	NS
Reading Kits	NS	NS	NS	NS	NS
Teacher-Made Materials	NS	NS	NS	NS	NS
Games	NS	-.40(.02)	NS	NS	-.34(.05)
Newspapers	NS	NS	NS	NS	NS
Reading Workbooks: Basal	NS	NS	NS	NS	NS
Other Reading Workbooks	NS	NS	NS	NS	NS
Additional Materials	NS	NS	NS	NS	NS

* Not significant
** Parenthetical figure is level of significance

Table 27

Correlation Coefficients Between Materials Used
and Spring Pupil Test Scores Partialling Out
Fall Scores: Grade Five Reading

	PUPIL SCORES				
Work Diary Variables	CAT Reading	Application	Decoding	Achievement	Reading: Total
Basal Reader: State Adoption	NS*	NS	NS	NS	NS
Basal Reader: Other	NS	NS	NS	NS	NS
Individualized Materials	NS	NS	NS	NS	NS
Programmed Materials	NS	NS	NS	NS	NS
Taped Materials	NS	NS	NS	NS	NS
Reading Kits	NS	NS	NS	NS	NS
Teacher-Made Materials	.28(.07)**	NS	NS	NS	NS
Games	NS	NS	NS	NS	NS
Newspapers	NS	NS	NS	NS	NS
Reading Workbooks: Basal	.25(.10)	NS	NS	NS	NS
Other Reading Workbooks	NS	-.28(.07)	-.45(.01)	NS	NS
Additional Materials	NS	-.31(.04)	-.32(.04)	NS	-.34(.03)

* Not significant
** Parenthetical figure is level of significance

Table 28

Correlation Coefficients Between Materials Used
and Spring Pupil Test Scores Partialling Out
Fall Scores: Grade Two Mathematics

	PUPIL SCORES			
Work Diary Variables	Concepts	Computation	Application	Math: Total
Mathematics Text: State Adoption	NS*	NS	NS	NS
Mathematics Text: Other	NS	NS	NS	NS
Individualized Materials	NS	NS	.42(.01)	.32(.06)
Programmed Materials	NS	.50(.01)**	NS	.47(.01)
Taped Programs	NS	NS	NS	NS
Kits and Manipulative Materials	NS	NS	NS	NS
Teacher-Made Materials	NS	NS	.28(.09)	.42(.01)
Games	NS	NS	NS	NS
Workbooks: Basal	NS	NS	NS	NS
Workbooks: Other	NS	NS	NS	NS

* Not significant
** Parenthetical figure is level of significance

Table 29

Correlation Coefficients Between Materials Used
and Spring Pupil Test Scores Partialling Out
Fall Scores: Grade Five Mathematics

	PUPIL SCORES			
Work Diary Variables	Concepts	Computation	Application	Math: Total
Mathematics Text: State Adoption	NS *	-.25(.10) **	NS	NS
Mathematics Text: Other	NS	NS	NS	NS
Individualized Materials	NS	.37(.01)	.26(.08)	.32(.03)
Programmed Materials	NS	NS	NS	NS
Taped Programs	NS	NS	NS	NS
Kits and Manipulative Materials	NS	NS	NS	NS
Teacher-Made Materials	NS	NS	NS	NS
Games	NS	NS	NS	NS
Workbooks: Basal	NS	NS	NS	NS
Workbooks: Other	NS	NS	-.30(.04)	NS

* Not significant
** Parenthetical figure is level of significance

types of materials in both subject areas at both grade levels. The materials "scores" used for these tables reflected the approximate percentage of the total reading or mathematics program in which the teacher used each specific type of material. For example, a teacher with a higher score or percentage in the use of basal readers would be one who used that kind of material more than did other teachers. That does not mean that other materials were not used. Further analyses might include an examination of the patterns of materials usage which impact on pupil growth.

Teachers were also asked to describe what kinds of materials they used in some detail. It might be interesting, for example, to review the Diaries of second grade teachers to see what "other basal readers" were used, which had a negative impact on pupil growth in reading application skills; or, to determine what "other reading workbooks" and "additional materials" related inversely to fifth grade pupil reading growth; or, to ascertain what kinds of programmed materials related so strongly to second grade pupil computational and total mathematics skill growth. (Less than 20 percent of the second grade teachers reported using programmed materials.)

Materials are not magic in themselves. Teachers may utilize the same materials in different ways with different pupils, or they may use different materials with different pupils. Further analysis of the mathematics observational data in those seven classrooms where programmed materials were used might yield descriptions of how the materials were used, how often, and with what kinds of pupils. As has been true of many of the teacher reported indices of instructional activities described in this report, the study of materials usage could be developed and expanded substantially in a variety of ways.

Summary and Conclusions

Teacher reports of their instructional activities and procedures are an interesting and potentially valid source of descriptive information about classrooms. The information from the Work Diaries and Program Overviews was organized to indicate, by grade level and within subject areas, the academic emphasis, the quality of the teaching methodology, the complexity of organizational structure, and the variety and types of instructional materials used. The accuracy of sections of the teacher reports was tested against observational information from the project classrooms and related to pupil skill growth in reading and mathematics.

Academic Emphases

Academic emphases included three general information categories: how much time teachers reported spending in preparing for and teaching reading and mathematics skills, how frequently teachers reported teaching specific reading and mathematics skills, and the specific skills in reading and mathematics that teachers reported they did not plan to teach. Some of the more interesting results of how teachers reported spending their time are presented below.

- Second grade teachers spent more time preparing for and teaching reading than did fifth grade teachers.
- Fifth grade teachers spent more time preparing for and teaching mathematics than did second grade teachers.
- The amount of total teacher preparation time had no relation to pupil skill growth in mathematics and an inverse relation to pupil skill growth in reading. Greater amounts of preparation time were associated with poorer reading comprehension skills for fifth grade pupils.

- The amount of direct teaching time had no relationship to pupil skill growth in mathematics but did relate to second grade pupil skill growth in decoding.

- There was greater grade level variation in time spent teaching specific reading skills than there was in the teaching of specific mathematics skills.

- Second grade teachers, as would be expected, spent more absolute and proportional time teaching decoding and vocabulary skills than did fifth grade teachers.

- Both second and fifth grade teachers spent more time teaching more generic reading comprehension and reading application skills than they did teaching more specific decoding and vocabulary skills.

- Greater amounts of time spent teaching the more specific decoding and vocabulary reading skills to fifth grade pupils was associated with poorer pupil performance on the more generic reading tasks, comprehension application and achievement.

- The time second grade teachers reported spent in teaching specialized skills in mathematics was negatively related to pupil growth in computation skills, and positively related to concept skill growth.

The time teachers spent teaching specific reading and mathematics skills in relationship to pupil performance suggests a variety of research tasks which might focus on the identification of optimal ranges of time for teaching specific skills to pupils in classrooms with a variety of skills configurations. Our data suggest, for example, that fifth grade teachers who emphasize basic decoding and vocabulary skills during reading instruction may do so at the expense of pupil skill growth in comprehension skills.[9]

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[9]The time teachers reported spending in preparing for and teaching reading or mathematics skills was the basis for the combined category, WD-1, included in the analyses described in Volume I of the final report.

Teachers were asked to check skills that they had "introduced" or "reviewed" during each of the two weeks the Diaries were maintained, in other words, skills they had actually taught. Teachers were also asked to indicate in the Program Overviews which specific skills would not be taught during the school year, either because "pupils already know these skills" or "these skills are taught at a higher level." Some of the results of the reported frequency of skills taught[10] were:

- The number of skills taught had little proportional relationship to the time spent teaching within a skill area. Second grade teachers, for example, reported spending about twice as much time teaching decoding skills as did fifth grade teachers. The numbers of actual skills taught, however, do not appear that different (ten skills and eight skills).

- As was the case in time spent, there was greater grade level variation in number of skills taught in reading than there was in mathematics.

But where the number of skills taught differed it made a difference in pupil skills, particularly in mathematics.

- The number of specific skills taught related to pupil skill growth in mathematics at both grade levels, and was particularly important for second grade pupils.

- The number of teachers who did not plan to teach specific skills was relatively small in both reading and mathematics. But the decision not to teach certain skills related to pupil outcomes in several instances. For example, the decision not to teach certain decoding and vocabulary skills by a relatively small proportion of second grade teachers was related to poorer decoding and vocabulary skill growth of their pupils.

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[10] The frequency of skills taught and not taught provided the basis for the combined category score WD-2, included in the analyses described in Volume I of the final report.

The Quality of the Teaching Methodology

Teachers were asked to describe the teaching strategies, pupil activities, and materials used both for the skills they introduced and the skills they reviewed during a given week. Their responses were rated.[11] Neither score by itself related to pupil skill growth at the second grade level; one related to pupil skill growth in fifth grade reading.

The Complexity of the Organizational Structure in the Classroom

Organizational structure included two general types of information about the project classrooms. Teachers reported how they grouped children for reading and mathematics instruction, and what proportion of the pupils were taught reading or mathematics only by themselves. The ratio of teaching adults to children was also determined for both subject areas.[12]

- Pupils were grouped differently for reading and mathematics instruction. Simultaneous instruction of all pupils was the most common pattern used for mathematics instruction, and grouping by general reading level was the most common for reading instruction.

- Grouping practices did not relate to fifth grade pupil achievement in mathematics. However, they did relate to several kinds of pupil achievement in reading and in second grade mathematics. For example, grouping by general reading level, the most common convention, related positively to second grade pupil skill growth in application skills and negatively to decoding skill growth for fifth grade pupils.

- Few teachers reported individualized instruction as their preferred organizational mode.

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[11] The "scores" became the combined category WD-3, included in the analyses described in Volume I of the final report.

[12] These variables became the basis for the combined category of teaching performances called WD-4 in Volume I of the final report.

- Individualized reading instruction was associated with poorer second grade pupil performance on reading application tasks, but individualized mathematics instruction was associated with second grade pupil growth in mathematics skills.

- More fifth grade pupils were taught reading and mathematics exclusively by their teacher than were second grade pupils.

- Second grade teachers utilized up to six teaching adults during reading instruction, and up to five during mathematics. Fifth grade teachers who shared teaching or preparation responsibilities did so with a maximum of one or two other adults.

- Pupil skill growth in reading, particularly that of second grade pupils, was associated with the proportion of pupils taught exclusively by their teacher. No such association was evident for mathematics instruction.

The generalization that the percentage of pupils taught exclusively by the teacher related to reading skill growth at both grade levels was an intriguing finding. A variety of teaching configurations was represented in the sample: team teaching, multiple level, nongraded and open classrooms. A variety of human and school resources was available to some teachers: aides, student teachers, volunteers, reading specialists and learning laboratories. Under the circumstances (particularly in the case of the younger pupils) the simple generalization that pupil skill growth in reading may relate to the proportion of pupils taught exclusively by the teacher should be studied further. Although the data gathered from the paraprofessionals and other teaching adults was not detailed for this report, it is of considerable interest to note that the Work Diary variables associated with other teaching adults were consistently and significantly related to lack of pupil growth in reading and mathematics skills.

The Variety and Types of Instructional Materials Used in Reading and Mathematics Programs

Teachers were asked to approximate the percentage of their reading and mathematics programs in which they used the types of materials listed.[13] The teachers were provided with a list of twelve different types of reading materials and ten different types mathematics materials. Space was provided to specify the exact materials used and to indicate any types not included in the list.

- Patterns of reading materials usage varied between second and fifth grade. Second grade teachers, for example, used basal readers more than did the fifth grade teachers, who relied more on individualized materials and reading kits.
- There was little percentage difference between second and fifth grade usage of the ten types of mathematics instructional materials.
- The use of the state adopted reading basal textbook series was associated with second grade pupil growth in application skills.
- The use of the state adopted mathematics basal textbook series at fifth grade was associated with poor pupil performance in computation skills.
- The use of programmed materials was associated with second grade pupil growth in computation and total mathematics skills.

Teacher Reports of Their Activities and Observations of Those Activities

The validity of teacher reports of their activities was explored in comparison to selected observational variables. Our purpose was to determine if reports provided by teachers related

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[13]The materials used in reading and mathematics instruction were aggregated somewhat differently to provide the basis for the combined category WD-5 described in Volume I of the final report. There the number of different kinds of materials used became the index for WD-5.

to other information obtained in the study. The validity of teacher reports considered were as follows:

1) Teacher reports about the organization of pupils for reading and mathematics instruction was compared with observed classroom organizational patterns; and
2) Teacher reports of time spent teaching specific reading and mathematics skills was compared with observed incidence of positive pupil learning.

Teachers were asked to indicate in the Work Diaries which one organizational pattern most nearly described their current reading program. Their choices were: simultaneous instruction of all pupils, pupils grouped by reading level, pupils grouped by skill needs, individualized instruction and an open-ended "other" category. The four specific organizational patterns reported are compared with the six instructional contexts in which pupils were observed to be working. Observed and teacher reported organization of pupils for learning seem to be consistent to the degree that further research would be warranted to refine systems for teachers to report their own organizational strategies.

An interesting aspect of this analysis was that during reading and mathematics activities at both grade levels adults other than the teacher were observed working in classrooms where the teacher reported that children were grouped instructionally for specific skill need. Only about one-third of the second grade teachers and about fifteen percent of the fifth grade teachers reported that they did <u>not</u> teach reading and mathematics to all of their pupils themselves.

Therefore, we are discussing a relatively small proportion of the teachers. Teachers were not observed (to a degree where significant correlations emerged) teaching groups of pupils in classrooms where they reported grouping by skill level. It appears that teachers who use other adults as instructors frequently assign the major responsibility for specific skill instruction to the other teaching adults. As we have previously suggested, instruction associated with other teaching adults was consistently and negatively associated with pupil achievement.

The second test of the validity of teacher reports was a comparison of the reported time spent teaching specific reading and mathematics skills compared with observed evidence of pupil demonstrations of those skills. The correlations were small and the levels of significance approached the liberal .10 level arbitrarily set by the authors as the cut off point for these analyses. Nevertheless, the reports of teachers about time spent teaching specific skills appeared to be reflected in evidence of pupil skills in those areas.

Teacher reports of their instructional activities, procedures and materials have demonstrated their utility and quality in this study. The Phase II teachers who expended so much effort in providing that information should be gratified to know that the results justify their efforts. "Self-reporting" as a reputable form of gathering research information may have gained new lustre as a result of their careful efforts.

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APPENDIX

Reading Program Overview

Mathematics Program Overview

Reading Work Diary

Mathematics Work Diary

Reading and Mathematics Work Diary for Paraprofessionals and Other Teaching Adults in the Classroom

Name_____ Grade_____

School_____ Date_____

READING PROGRAM OVERVIEW

This section of the Work Diary is intended to reflect your reading program for the whole year. Please complete it for your current class by putting a check in the boxes that best describe your program.

List of Skills	Which skills need not be taught because pupils already know these skills?	Which skills have you introduced this year?	Which skills have you reviewed this year?	Which skills will you be teaching in the remaining months of the school year?	Which skills are not taught at your grade level because these skills are taught at a higher level?
I. Decoding					
(a) Phonetic					
Symbol - sound relationship					
Consonant sounds					
Consonant blends					
Short vowels					
Long vowels					
Vowel digraphs					
Syllabification					
Accent/stress					
(b) Structural					
Compound words					
Recognizing root words					
Prefixes					
Suffixes					
Contractions					
II. Vocabulary					
Function words (Dolch, etc)					
Sight words - Basal					
Sight words - Others					

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RPO (cont'd)

III. Comprehension	Which skills need not be taught because pupils already know these skills?	Which skills have you introduced this year?	Which skills have you reviewed this year?	Which skills will you be teaching in the remaining months of the school year?	Which skills are not taught at your grade level because these skills are taught at a higher level?
Using pictures as a clue to meaning					
Using context clues					
Understanding the main idea					
Recognizing the details					
Use of punctuation for clues to meaning					
Predicting the outcome					
Understanding idiomatic expressions					
Figurative language					
Understanding factual material					
Recognizing organizational clues for meaning (table of contents, index, chapter heading, etc.)					

IV. Application					
Alphabetizing					
Understanding directions					
Evaluating materials and ideas					
Recognizing facts and opinions					
Synthesizing ideas					
Fostering appreciation of reading					
Skimming					

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RPO (cont'd)

IV. Application (continued)	Which skills need not be taught because pupils already know these skills?	Which skills have you introduced this year?	Which skills have you reviewed this year?	Which skills will you be teaching in the remaining months of the school year?	Which skills are not taught at your grade level because these skills are taught at a higher level?
Increasing speed					
Providing opportunities for reading various types of materials					
Oral reading skills					
Interpretive reading					
Dictionary skills					
Written reports and projects					
Creative writing					

Please indicate the approximate percentage of your total reading program in which you use the following materials.

_____ (a) Basal reader - state adoption (specify)_____

_____

_____ (b) Basal reader - other (specify)_____

_____

_____

_____ (c) Individualized materials (briefly describe)_____

_____

_____

_____ (d) Programmed materials (briefly describe)_____

_____

_____

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RPO (cont'd)

_____ (e) Taped programs

_____ (f) Reading kits (specify)_____

_____ (g) Teacher-made materials

_____ (h) Games

_____ (i) Newspapers

_____ (j) Reading workbooks that accompany a basal text

_____ (k) Other reading or phonics workbooks (specify)_____

_____

_____

_____ (l) Additional materials (specify)_____

_____

_____

_____

Comments on materials used_____

_____

_____

_____

_____

If you have developed your own materials, please describe the types of materials developed, and the purposes for which the materials were developed.

_____

_____

_____

_____

BTES 2/26/74

RPO (cont'd)

Utilization of Human Resources in
Addition to the Classroom Teacher

We would like to gather information about the use of other teaching adults for the teaching of reading in your classroom. This section of the Work Diary is intended to reflect your program for the entire year. Please complete the following section.

1. Indicate if any of the following are included in your reading program (check all resources available to you).

_____ (a) Reading specialist

_____ (b) Teacher aide

_____ (c) Adult volunteer

_____ (d) Peer tutor

_____ (e) Older pupil tutor

_____ (f) Team teacher

(g) Others (please specify)_____

_____

_____

_____

(h) List the title(s) of any resource person(s) available for advice only

_____

_____

_____

_____

2. Please indicate the approximate percentage of the children in your class who are taught reading exclusively by you.

100% 75% 66 2/3% 50% 33 1/3% 25% 20% 10% 5% 0%

2a. If the answer to question #2 is less than 100%, who teaches reading to the rest of the children? Circle all appropriate titles.

Aide Volunteer Principal Resource Teacher Intern

Student Teacher Speech Teacher Team Teacher

Reading Specialist Older Pupils

Other(s) (specify)_____

_____

_____

_____

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RPO (cont'd)

2b. If you use other pupils to assist in teaching reading, specify the ages or grades of the pupil tutors.

_____

_____

_____

3. How do you select the children with whom the resource person (or persons) works? ("Resource person", as we are using the term, refers to any classroom assistant you may have.)

_____

_____

_____

4. Does the resource person (or persons) work in your classroom? Yes__ No__

4a. If the resource person (or persons) does not work in your classroom, please identify the location where he or she works with the pupils.

_____

_____

_____

5. In your experience, what kinds of training and background are helpful for a resource person to have?

_____

_____

_____

6. In your experience, what kinds of personal attributes are helpful for a resource person to have?

_____

_____

_____

7. Approximately how many minutes per week does each person (or persons) spend teaching reading in your class?

_____

BTES 2/26/74

RPO (cont'd)

8. How does each resource person (or persons) decide what to do?

_____

_____

_____

_____

_____

9. What does each resource person (or persons) do? Please specify the resource person in the spaces provided after any appropriate activity.

Provides all reading instruction for the children listed_____

Performs diagnostic testing_____

Teaches phonics and decoding only_____

Teaches English as a second language_____

Assists with vocabulary development_____

Checks comprehension_____

Checks oral reading_____

Assists children with seatwork_____

Corrects seatwork_____

Takes dictation_____

Reads to children_____

Prepares material_____

Spells words for children_____

Maintains discipline_____

Performs clerical tasks_____

10. Were you trained during your teacher training to manage other teaching adults in a classroom?

Yes____ No____ Comments_____

_____

_____

Name _____ Grade _____

School _____ Date _____

M

MATHEMATICS PROGRAM OVERVIEW

This section of the Work Diary is intended to reflect your mathematics program for the whole year. Please complete it for your current class by putting a check in the boxes that best describe your program.

List of Skills	Which skills need not be taught because pupils already know these skills?	Which skills have you introduced this year?	Which skills have you reviewed this year?	Which skills will you be teaching in the remaining months of the school year?	Which skills are not taught at your grade level because these skills are taught at a higher level?
I. Problem Type					
Basic facts					
Terminology					
Simple numbers (no regrouping or transformations)					
Complex numbers (regrouping or transformations)					
Fractions					
Decimals					
Word problems					
II. Operations					
Abstract relations					
Addition					
Subtraction					
Multiplication					
Division					
Percent, ratio, proportion					
III. Specialized skills					
Set relations					
Number theory					
Time					
Money					
Graphing					
Geometry					
Measurement (actual)					
Measurement (representative)					

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MPO (cont'd)

Please indicate the approximate percentage of your total mathematics program in which you use the following materials.

_____ (a) Mathematics text - state adoption

_____ (b) Mathematics text - other (specify) _____

_____

_____

_____ (c) Individualized materials (briefly describe) _____

_____

_____

_____ (d) Programmed materials (briefly describe) _____

_____

_____

_____ (e) Taped programs

_____ (f) Mathematics kits and manipulation materials

_____ (g) Teacher-made materials

_____ (h) Games

_____ (i) Mathematics workbooks that accompany a basal text

_____ (j) Other mathematics workbooks (specify) _____

_____

_____

_____

Comments on materials used _____

_____

_____

_____

_____

MPO (cont'd)

UTILIZATION OF HUMAN RESOURCES
IN ADDITION TO THE CLASSROOM TEACHER

We would like to gather information about the use of other teaching adults for the teaching of mathematics in your classroom. This section of the Work Diary is intended to reflect your program for the entire year. Please complete the following section.

1. Indicate if any of the following are included in your mathematics program (check all resources available to you).

_____(a) Mathematics specialist

_____(b) Teacher aide

_____(c) Adult Volunteer

_____(d) Peer tutor

_____(e) Older pupil tutor

_____(f) Team teacher

(g) Others (please specify)

_____

_____

(h) List the title(s) of any other resource person(s) available for advice only

_____

_____

2. Please indicate the approximate percentage of the children in your class who are taught mathematics exclusively by you.

100% 75% 66 2/3% 50% 33 1/3% 25% 20% 10% 5% 0%

2a. If the answer to question #2 is less than 100%, who teaches mathematics to the rest of the children? Circle all appropriate titles.

Aide Volunteer Principal Resource Teacher Intern Other Pupils

Student Teacher Mathematics Specialist Team Teacher Learning Assistant

Other(s) (specify) _____

_____

_____

2b. If you use other pupils to assist in teaching mathematics, specify the ages or grade levels of the pupil tutors. _____

_____

_____

MPO (cont'd)

3. How do you select the children with whom the resource person (or persons) works? ("Resource person", as we are using the term, refers to any classroom assistant you may have.)

_____

_____

_____

4. Does the resource person (or persons) work in your classroom?

Yes _____ No _____

4a. If the resource person (or persons) does not work in your classroom, please identify the location where he or she works with the pupils.

_____

_____

5. In your experience, what kinds of traning and background are helpful for a resource person to have?

_____

_____

_____

6. In your experience, what kinds of personal attributes are helpful for a resource person to have?

_____

_____

_____

7. Approximately how many minutes per week does each person (or persons) spend teaching mathematics in your class?

_____

8. How does each resource person (or persons) decide what to do?

_____

_____

_____

_____

_____

_____

MPO (cont'd)

9. What does this person (or persons) do? Please specify each type of resource person in the spaces provided after any appropriate activity.

Provides all mathematics instruction for the children listed _____

_____

Performs diagnostic testing _____

Teaches simple computation only _____

Teaches basic facts in addition and subtraction _____

Works with individual children to explain terminology _____

Works with individual children to work problems _____

Assists children with seatwork _____

Corrects seat work _____

Prepares materials and demonstrations _____

Maintains discipline _____

Performs clerical tasks _____

R 91

Name _____ Grade _____

School _____ Date _____

READING
WORK DIARY

This section of the Work Diary is intended to reflect your reading program for one week. You will be asked to complete the Work Diary three times.

Week of _____ to _____

1. Please record the approximate number of minutes you spent each day this week in preparation for teaching reading.

Mon.	Tues.	Wed.	Thurs.	Fri.
Min.	Min.	Min.	Min.	Min.

SKILLS TAUGHT AND EMPHASIZED

2. Check the types of skills you introduced or reviewed this week. Check also any of those introduced or reviewed skills which you emphasized.

Skills Taught

List of Skills	Skills Introduced	Skills Reviewed	Skills Emphasized
I. Decoding			
(a) Phonetic			
Symbol - sound relationship			
Consonant sounds			
Consonant blends			
Short vowels			
Long vowels			
Vowel digraphs			
Syllabification			
Accent/stress			
(b) Structural			
Compound words			
Recognizing root words			
Prefixes			
Suffixes			
Contractions			
II. Vocabulary			
Function words (Dolch, etc)			
Sight words - Basal			
Sight words - Others			

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RWD (cont'd)

III. Comprehension

Using pictures as a clue to meaning			
Using context clues			
Understanding the main idea			
Recognizing the details			
Use of punctuation for clues to meaning			
Predicting the outcome			
Understanding idiomatic expressions			
Figurative language			
Understanding factual material			
Recognizing organizational clues for meaning (table of contents, index, chapter heading, etc.)			

IV. Application

Alphabetizing			
Understanding directions			
Evaluating materials and ideas			
Recognizing facts and opinions			
Synthesizing ideas			
Fostering appreciation of reading			
Skimming			
Increasing speed			
Providing opportunities for reading various types of materials			
Oral reading skills			
Interpretive reading			
Dictionary Skills			
Written reports and projects			
Creative writing			

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RWD (cont'd)

3. Please record the approximate number of minutes you spent each day in the direct teaching of reading.

Mon.	Tues.	Wed.	Thurs.	Fri.
Min.	Min.	Min.	Min.	Min.

4. Please record the approximate amount of time you spent teaching each type of skill each day this week. This may be difficult, but try to approximate it to whatever extent you can.

	Mon.	Tues.	Wed.	Thurs.	Fri.
Decoding	Min.	Min.	Min.	Min.	Min.
Vocabulary	Min.	Min.	Min.	Min.	Min.
Comprehension	Min.	Min.	Min.	Min.	Min.
Application	Min.	Min.	Min.	Min.	Min.

DESCRIPTION OF THE CLASSROOM ENVIRONMENT

5. Briefly describe the teaching strategies, pupil activities, and materials used for those skills introduced and emphasized during the week.

6. Briefly describe the teaching strategies, pupil activities, and materials used for those skills reviewed and emphasized during the week.

RWD (cont'd)

READING CLASS ORGANIZATION

7. What is the current organization of your reading class? Indicate below the one organizational pattern that most nearly describes your reading program now. (You may be using all to some degree).

_____ (a) Pupils are taught all reading skills simultaneously

_____ (b) Pupils are organized in reading groups based on their reading level.

_____ (c) Pupils are organized in reading groups based on their needs for particular skills.

_____ (d) Pupils are organized in individual reading instruction.

_____ (e) Other (please describe) _____

_____

_____

_____

_____

_____

8. (a) If your pupils are organized in reading groups based on their reading level (7b above), describe the groups - how many groups, what kinds of groups, the number of pupils in each group, etc.

_____

_____

_____

_____

_____

(b) If your pupils are organized in reading groups based on their needs for particular skills (7c above), describe the groups - how many groups, what kinds of groups, the number of pupils in each group, etc.

_____

_____

_____

_____

_____

(c) If your pupils are organized in an individualized reading instruction program (7d above), describe the program and how pupils are placed in the program.

_____

_____

_____

_____

_____

_____

RWD (cont'd)

8. (d) We would like to determine which of the reading skills you taught this week to specific groups of children in your class. Transfer your responses to question two to the Skills Taught column of the chart following.

If you organize your reading class so that all pupils are taught simultaneously (7a) the answers you gave to question two will describe your activities for the week.

If you group your pupils either by level or skill need (7b or 7c), complete the chart under the heading Group Program. Circle the number of groups you have and write in the type of group under each circled heading. Complete the chart by entering the number of children in each group taught each skill.

If you have an individualized program (7d) complete the chart under the heading Individualized Program. Complete the chart by entering the number of children in each group taught each skill.

If you checked (7e) and described your program use the heading (Group or Individualized) that most closely approximates your program. Complete the chart by entering the number of children in each group taught each skill.

RED (cont'd)

List of Skills	Skills Taught: Skills Intro.	Skills Taught: Skills Review	Skills Taught: Skills Emphasis	Pupils to Whom Skills Were Taught: Group Program: Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Individualized Program: 1 - 2 Children	More than 2 Children
Type of Group				____	____	____	____	____	____		
I. Decoding											
(a) Phonetic											
Symbol - sound relationship											
Consonant sounds											
Consonant blends											
Short vowels											
Long vowels											
Vowel digraphs											
Syllabification											
Accent/stress											
(b) Structural											
Compound words											
Recognizing root words											
Prefixes											
Suffixes											
Contractions											

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RWD (cont'd)

List of Skills	Skills Intro.	Skills Review.	Skills Emphasis	Group Program: Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Individualized Program: 1 - 2 Children	more than 2 Children
	Skills Taught			Pupils to Whom Skills Were Taught							
				Type of Group							
II. Vocabulary											
Function words (Dolch, etc)											
Sight words (Basal)											
Sight words (Others)											
III. Comprehension											
Using pictures as a clue to meaning											
Using context clues											
Understanding the main idea											
Recognizing the details											
Use of punctuation for clues to meaning											
Predicting the outcome											
Understanding idiomatic expressions											
Figurative language											
Understanding factual material											
Recognizing organizational clues for meaning (table of contents, index, etc.)											

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RWD (cont'd)

List of Skills	Skills Taught: Skills Intro.	Skills Review.	Skills Emphasiz	Pupils to Whom Skills Were Taught: Group Program: Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Individualized Program: 1 - 2 Children	more than 2 Children
IV. Application	Type of Group			____	____	____	____	____	____		
Alphabetizing											
Understanding directions											
Evaluating materials and ideas											
Recognizing facts and opinions											
Synthesizing ideas											
Fostering appreciation of reading											
Skimming											
Increasing speed											
Providing opportunities for reading various types of materials											
Oral reading skills											
Interpretive reading											
Dictionary skills											
Written reports and projects											
Creative writing											

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RWD (cont'd)

Utilization of Human Resources in
Addition to the Classroom Teacher

We would like to gather information about the use of additional human resources for the teaching of reading in your classroom during this week. Please complete the following section.

1. Indicate if any of the following are included in your reading program (check all resources available to you).

_____(a) Reading specialist

_____(b) Teacher aide

_____(c) Adult volunteer

_____(d) Peer tutor

_____(e) Older pupil tutor

_____(f) Team teacher

(g) Others (please specify)

_____

_____

(h) List the title(s) of any resource person(s) available for advise only

_____

_____

2. Please indicate the approximate percentage of the children in your class who are taught reading exclusively by you.

100% 75% 66 2/3% 50% 33 1/3% 25% 20% 10% 5% 0%

2a. If the answer to the question is less than 100%, who teaches reading to the rest of the children? Circle all appropriate titles.

Aide Volunteer Principal Resource Teacher Intern

Student Teacher Speech Teacher Team Teacher

Reading Specialist Other Pupils

Other(s) (specify) _____

_____

_____

2b. If you use pupils to assist in teaching reading, specify the ages or grades of the pupil tutors.

_____

_____

RWD (cont'd)

3. Please list the children (by name) taught by each type of resource person circled above. ("Resource person", as we are using the term, refers to any classroom assistant you may have.) Indicate the type of resource person at the top of each list of children. Use the back of this sheet if necessary.

Resource Persons

a._____ b._____ c._____

Children Taught

1._____	1._____	1._____
2._____	2._____	2._____
3._____	3._____	3._____
4._____	4._____	4._____
5._____	5._____	5._____
6._____	6._____	6._____

4. Where does each resource person (or persons) do this teaching?

Name	Location
_____	_____
_____	_____
_____	_____

5. Please describe the training or experience each person (or persons) has had (i.e., certificated teacher, volunteer tutor for three years).

Name	Experience
_____	_____
_____	_____
_____	_____

6. Approximately how many minutes per week does each person (or persons) spend teaching reading in your class?

_____

7. How does each resource person (or persons) decide what to do?

_____

_____

_____

BTES 2-26-74

RWD (cont'd)

8. What does each resource person (or persons) do? Please specify the resource person in the spaces provided after any appropriate activity.

Provides all reading instruction for the children listed_____

Performs diagnostic testing_____

Teaches phonics and decoding only_____

Teaches English as a second language_____

Assists with vocabulary development_____

Checks comprehension_____

Checks oral reading_____

Assists children with seatwork_____

Corrects seatwork_____

Takes dictation_____

Reads to children_____

Prepares material_____

Spells words for children_____

Maintains discipline_____

Performs clerical tasks_____

M

Name_____ Grade_____

School_____ Date_____

MATHEMATICS
WORK DIARY

This section of the Work Diary is intended to reflect your mathematics program for one week. You will be asked to complete the Work Diary three times.

Week of_____ to _____

1. Please record the approximate number of minutes you spent each day this week in preparation for teaching mathematics.

Mon.	Tues.	Wed.	Thurs.	Fri.
Min.	Min.	Min.	Min.	Min.

2. Check the types of skills you introduced or reviewed this week. Check also any of those introduced or reviewed skills you emphasized.

SKILLS TAUGHT

List of Skills	Skills Introduced	Skills Reviewed	Skills Emphasized
I. Problem Type			
Basic facts			
Terminology			
Simple numbers (no regrouping or transformations)			
Complex numbers (regrouping or transformations)			
Fractions			
Decimals			
Word problems			
II. Operations			
Abstract relations			
Addition			
Subtraction			
Multiplication			
Division			
Percent, ratio, proportion			
III. Specialized skills			
Set relations			
Number theory			
Time			
Money			
Graphing			
Geometry			
Measurement (actual)			
Measurement (representative)			

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MWD (cont'd)

3. Please record the approximate number of minutes you spent each day in the direct teaching of mathematics.

Mon.	Tues.	Wed.	Thurs.	Fri.
Min.	Min.	Min.	Min.	Min.

4. Please record the approximate amount of time you spent teaching each type of skill each day this week. This may be difficult, but try to approximate it to whatever extent you can.

	Mon.	Tues.	Wed.	Thurs.	Fri.
Problem type	Min.	Min.	Min.	Min.	Min.
Operations	Min.	Min.	Min.	Min.	Min.
Specialized Skills	Min.	Min.	Min.	Min.	Min.

DESCRIPTION OF THE CLASSROOM ENVIRONMENT

5. Briefly describe the teaching strategies, pupil activities, and materials used for those skills introduced and emphasized during the week.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

MWD (cont'd)

6. Briefly describe the teaching strategies, pupil activities, and materials used for those skills reviewed and emphasized during the week.

_____

_____

_____

_____

_____

_____

_____

_____

_____

7. What is the current organization of your mathematics class? Indicate below the one organizational pattern that most nearly describes your mathematics program now. (You may be using all to some degree.)

____ (a) Pupils are taught all mathematics skills simultaneously.

____ (b) Pupils are organized in mathematics groups based on their mathematics level.

____ (c) Pupils are organized in mathematics groups based on their needs for particular skills.

____ (d) Pupils are organized in individual mathematics instruction.

____ (e) Other (please describe)_____

_____

_____

8. (a) If your pupils are organized in mathematics groups based on their mathematics level (7b above), describe the groups - how many groups, what kinds of groups, the number of pupils in each group, etc.

_____

_____

_____

_____

MWD (cont'd)

8. (b) If your pupils are organized in mathematics groups based on their needs for particular skills (7c above), describe the groups - how many groups, what kinds of groups, the number of pupils in each group, etc.

_____

_____

_____

_____

(c) If your pupils are organized in an individualized mathematics program (7d above), describe the program and how pupils are placed in the program.

_____

_____

_____

_____

(d) We would like to determine which of the mathematics skills you taught this week to specific groups of children in your class. Transfer your responses to question two to the Skills Taught column of the chart following.

If you organize your mathematics class so that all pupils are taught simultaneously (7a) the answers you gave to question two will describe your activities for the week.

If you group your pupils either by level or skill need (7b or 7c), complete the chart under the heading Group Program. Circle the number of groups you have and write in the type of group under each circled heading. Complete the chart by entering the number of children in each group taught each skill.

If you have an individualized program (7d) complete the chart under the heading Individualized Program. Complete the chart by entering the number of children in each group taught each skill.

If you checked (7e) and described your program use the heading (Group or Individualized) that most closely approximates your program. Complete the chart by entering the number of children in each group taught each skill.

MWD (cont'd)

List of Skills	Skills Taught: Skills Intro.	Skills Reviewed	Skills Emphasized	Pupils to Whom Skills were Taught: Group Program: Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Individualized Program: 1 - 2 Children	more than 2 children
Type of Group				____	____	____	____	____	____		
I. Problem Type											
Basic facts											
Terminology											
Simple numbers (no regrouping or transformations)											
Complex numbers (regrouping or transformations)											
Fractions											
Decimals											
Word problems											
II. Operations											
Abstract relations											
Addition											
Subtraction											
Multiplication											
Division											
Percent, ratio, proportion											

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MWD (cont'd)

List of Skills	Skills Taught: Skills Intro.	Skills Taught: Skills Reviewed	Skills Taught: Skills Emphasized	Pupils to Whom Skills were Taught: Group Program: Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Individualized Program: 1 - 2 Children	More than 2 Children
Type of Group				____	____	____	____	____	____		
III. Specialized Skills											
Set relations											
Number theory											
Time											
Money											
Graphing											
Geometry											
Measurement (actual)											
Measurement (representative)											

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MWD (cont'd)

Utilization of Human Resources in
Addition to the Classroom Teacher

We would like to gather information about the use of additional human resources for the teaching of mathematics in your classroom during this week. Please complete the following section.

1. Indicate if any of the following are included in your mathematics program (check all resources available to you).

____ (a) Mathematics specialist

____ (b) Teacher aide

____ (c) Adult volunteer

____ (d) Peer tutor

____ (e) Older pupil tutor

____ (f) Team teacher

(g) Other(s) (please specify)_____

_____

_____

_____

(h) List the title(s) of any resource person(s) available for advice only

_____

_____

_____

2. Please indicate the approximate percentage of the children in your class who are taught mathematics exclusively by you.

100% 75% 66 2/3% 50% 33 1/3% 25% 20% 10% 5% 0%

2a. If the answer to the question is less than 100%, who teaches mathematics to the rest of the children? Circle all appropriate titles.

Aide Volunteer Principal Resource Teacher Intern

Student Teacher Team Teacher Mathematics Specialist Other Pupils

Other(s) (specify)_____

_____

_____

_____

2b. If you use pupils to assist in teaching mathematics, specify the ages or grades of the pupil tutors.

_____

_____

MWD (cont'd)

3. Please list the children (by name) taught by each type of resource person circled above. ("Resource person", as we are using the term, refers to any classroom assistant you may have.) Indicate the type of resource person at the top of each list of children. Use the back of this sheet if necessary.

Resource Persons

a. _____ b. _____ c. _____

Children Taught

1. _____	1. _____	1. _____
2. _____	2. _____	2. _____
3. _____	3. _____	3. _____
4. _____	4. _____	4. _____
5. _____	5. _____	5. _____
6. _____	6. _____	6. _____

4. Where does each resource person (or persons) do this teaching?

Name	Location
_____	_____
_____	_____
_____	_____

5. Please describe the training or experience each person (or persons) has had (i.e., certificated teacher, volunteer tutor for three years).

Name	Experience
_____	_____
_____	_____
_____	_____

6. Approximately how many minutes per week does each person (or persons) spend teaching mathematics in your class?

_____

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MWD (cont'd)

7. How does each resource person (or persons) decide what to do?

_____

_____

_____

_____

_____

8. What does each resource person (or persons) do? Please specify the resource person in the spaces provided after any appropriate activity.

Provides all mathematics instruction for the children listed _____

Performs diagnostic testing _____

Teaches simple computation only _____

Teaches basic facts in addition and subtraction _____

Works with individual children to explain terminology _____

Works with individual children to work problems _____

Assists children with seatwork _____

Corrects seatwork _____

Prepares materials and demonstrations _____

Maintains discipline _____

Performs clerical tasks _____

A

READING AND MATHEMATICS WORK DIARY
FOR PARAPROFESSIONALS AND OTHER
TEACHING ADULTS IN THE CLASSROOM

NAME_____ GRADE(S)_____

SCHOOL_____ DATE_____

TEACHER_____

We would like to determine how paraprofessional teachers and other teaching adults assist in reading and mathematics instruction in each B.T.E.S. classroom. Each adult (paid or volunteer) who worked in the classroom during the week teachers complete a Work Diary should complete a separate "...Diary for Paraprofessionals..." Any high school students working in the classroom should also complete a Diary.

WEEK OF _____ TO _____

1. How many hours did you work this week in this classroom? _____

2. Do you work in the classroom approximately the same amount of time each week?
YES_____ NO_____

3. Are you paid (YES_____NO_____) or a volunteer (YES_____NO_____)?

READING ACTIVITIES

4. Please list the names of the children to whom you taught reading this week. Use the back of the page to complete the list if necessary.

1) _____ 4) _____

2) _____ 5) _____

3) _____ 6) _____

5. Do you work with the same children in reading each week? YES_____ NO_____

6. Did you work in reading with the pupils:

a) individually? YES_____ NO_____

b) in small groups? YES_____ NO_____

c) in large groups? YES_____ NO_____

d) any of the above depending on the task? YES_____ NO_____

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RMWD (continued)

7. Please record the approximate number of minutes you spent each day this week in planning or preparing materials for teaching reading in this classroom.

Mon.	Tues.	Wed.	Thurs.	Fri.
Min.	Min.	Min.	Min.	Min.

8. Please record the approximate number of minutes you spent each day in the direct teaching of reading in this classroom.

Mon.	Tues.	Wed.	Thurs.	Fri.
Min.	Min.	Min.	Min.	Min.

9. What kinds of things did you do? Please check any activities in which you were engaged.

_____ Teaching phonics and decoding skills (such as sound-symbol relationships, consonant sounds, short vowels, recognizing root words, prefixes, compound words, contractions, etc.)

_____ Vocabulary development (such as Dolch Function words, sight words from the Basal Reader, etc.)

_____ Comprehension (such as using pictures as a clue to meaning, using context clues, use of punctuation as clues to meaning, predicting outcomes, understanding the main idea, using the table of contents as an organizational clue, etc.)

_____ Application of reading skills (such as alphabetizing, dictionary skills, oral reading skills, written reports and projects, creative writing, etc.)

_____ All of the reading instruction for the children listed in Question Four

_____ Diagnostic testing

_____ Teaching English as a second language

_____ Assisting children with seatwork

_____ Correcting seatwork

_____ Taking dictation

_____ Reading to children

_____ Preparing material

_____ Spelling words

_____ Maintaining discipline

_____ Performing clerical tasks

RMWD (continued)

10. How did you decide what kinds of things to do in reading? _____

_____

_____

11. Do you spend about the same amount of time in working directly with pupils in reading activities each week?

YES___ NO___

12. Approximately what proportion of your time in the classroom did you spend teaching reading to pupils as opposed to planning, making materials or other activities?

____None of your time

____Less than one-half

____About one-half

____More than one-half

____All of your time

MATHEMATICS ACTIVITIES

13. Please list the names of the children to whom you taught mathematics this week. Use the back of the page to complete the list if necessary.

1) _____ 4) _____

2) _____ 5) _____

3) _____ 6) _____

14. Do you work with the same children in mathematics each week?

YES___ NO___

15. Did you work in mathematics with the pupils:
a) individually? YES___ NO___
b) in small groups? YES___ NO___
c) in large groups? YES___ NO___
d) any of the above depending on the task? YES___ NO___

16. Please record the approximate number of minutes you spent each day in planning or preparing materials for teaching mathematics in this classroom.

Mon.	Tues.	Wed.	Thurs.	Fri.
Min.	Min.	Min.	Min.	Min.

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RMWD (continued)

17. Please record the approximate number of minutes you spent each day in the direct teaching of mathematics in this classroom.

Mon.	Tues.	Wed.	Thurs.	Fri.
Min.	Min.	Min.	Min.	Min.

18. What kinds of things did you do? Please check any activities in which you were engaged.

_____ Teaching operations such as addition, subtraction, multiplication, division

_____ Teaching fractions, decimals, word problems, terminology

_____ Teaching special skills (time, money, graphing, geometry, set theory, etc.)

_____ All mathematics instruction for the children listed in Question Thirteen

_____ Diagnostic testing

_____ Assisting children with seatwork

_____ Correcting seatwork

_____ Preparing materials

_____ Maintaining discipline

_____ Performing clerical tasks

19. How do you decide what kinds of things to do in mathematics?

_____

_____

20. Do you spend about the same amount of time in working directly with pupils in mathematics activities each week?

YES____ NO____

21. Approximately what proportion of your time in the classroom did you spend teaching mathematics to pupils as opposed to planning, making materials or other activities?

_____None of your time

_____Less than one-half

_____About one-half

_____More than one-half

_____All of your time

RMWD (continued)

22. Approximately what proportion of your time in the classroom did you spend in reading activities, mathematics activities and other classroom activities?

Reading		Math		Other		
%	+	%	+	%	=	100%

RMWD (continued)

BIOGRAPHICAL DATA

1. Do you speak any language besides English? YES_____ NO_____

   a) If you do, please indicate what language you speak. _____

   b) If you speak another language, do you use that language in your teaching? YES_____ NO_____

2. Please indicate the number of years of education you have completed.

   _____ Less than eight years

   _____ Ten to twelve years

   _____ Twelve to fourteen years

   _____ Fourteen to sixteen years

   _____ More than sixteen years

3. How much inservice training (workshops, noncredit seminars, etc.) have you received in the teaching of reading? Please state the approximate number of days as best you can.

   _____

4. How effective has the training been to you in the teaching of reading?

   _____

Useless	Barely Adequate	Good	Very Good	Extremely Helpful

   Comments: _____

   _____

   _____

5. What other activities have you engaged in that you found helpful in the teaching of reading?

	Helpful	Not Helpful
a) Attending lectures or workshops that were not a part of any course	_____	_____
b) Conversations with supervisors	_____	_____
c) On-the-job training	_____	_____

   d) Others (please describe) _____

   _____

   _____

   _____

RMWD (continued)

6. How much inservice training (workshops, noncredit seminars, etc.) have you received in the teaching of mathematics? Please state the approximate number of days as best you can.

_____

7. How effective has it been to you in the teaching of mathematics?

Useless	Barely Adequate	Good	Very Good	Extremely Helpful

Comments: _____

_____

_____

8. What other activities have you engaged in that you found helpful in the teaching of mathematics?

	Helpful	Not Helpful
a) Attending lectures or workshops that were not a part of any course	____	____
b) Conversations with supervisors	____	____
c) On-the-job training	____	____

d) Other (please describe) _____

_____

_____

9. Including this year, what is the number of years of experience you have had in this school?

_____

10. What do you regard as your greatest strengths in working in the classroom

a) in reading? _____

_____

b) in mathematics? _____

_____

c) other activities (specify) _____

_____

Thank you for taking the time to complete the Work Diary. Your contribution will help us understand the kinds of classroom activities that help children learn.

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